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Pollen, Pollinators and their Ecological Importance

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POLLEN, POLLINATORS AND THEIR ECOLOGICAL IMPORTANCE - SCOPE FOR RESEARCH.

Roger J. Parsons
LNU President 2012 – 2013.

Abstract

Wild Honeybees have been part of our countryside for over 2000 years. Only when humans started to practice artificial selection can we say that they became domesticated. Domesticated and feral bees can reach almost every part of the UK mainland and in doing so they interact with wild and agricultural plant species and many species of wild pollinators. The more we can discover about these interactions, the more informed our decisions will be in conservation and agriculture.

Reproduction is the fundamental purpose of life. The ability to reproduce is a key definition of life itself. In reproduction the genes of one generation are passed on to the next. Characteristics of parent or parents are passed to the offspring. Some organisms are able to reproduce asexually, with offspring genetically identical to their parents except for chance variation. Sexual reproduction, in contrast, brings together genes which have been taken from two parents, determining the variation that will be found between parents and offspring, and also between individual offspring. Species reproduce to propagate, but how do species benefit from such "built in" variation?

Genetic Variation

The answer is that genetic variation provides characteristics upon which the process of evolution can operate. The probability of survival will vary between individuals within a population. Those with any advantage will stand a better chance of reproducing and thus, over time, their advantageous genes will become more frequent in the population. Two key factors determining the pace at which this evolution can take place are the number of offspring per generation and the time for these individuals to become reproducing adults. Bees and their associated flowers have been around for many millions of years.

Dawkins' Selfish Genes

DNA is found in the nucleus and in organelles such as the mitochondria. The chemical sequences in DNA code for the genes. Richard Dawkins' intriguing model of "the selfish gene" is a way of understanding the underlying process by which variation and selection carry forward selected genes into the future. Charles Darwin had reflected on the fact that many organisms have a far higher reproductive potential than they need to achieve a sustainable population. We would be swamped by birds if every egg hatched and fledgling survived. Why the high numbers and high wastage? The answer is that when more offspring are produced, the greater the pool on which the processes of evolution can act and the greater the probability that the "fittest" genotypes will survive.

A virgin queen honeybee bee mates with several drones and stores the sperm for use during her lifetime. To do this, in honeybees at least, she will make her nuptial flights to a drone congregation area where hundreds, even thousands of drones may be waiting in anticipation. There she will mate with perhaps 10 -20 drones, receiving and storing their gametes. Drones are haploid, with only one set of 16 chromosomes, and they develop from unfertilized eggs, a form of parthenogenesis. Females, be they workers or queens, are diploid with 32 chromosomes and develop from fertilized eggs.

Queens can mate with “brothers” but such inbred eggs are often detected and removed by workers, a tactic to minimise the genetic risks of inbreeding. Nuptial flights to the congregation area minimise further the risk of inbreeding and ensure a broad genetic diversity in the sperm that is stored. In due course some eggs will be raised as [diploid] queens and these will comprise 16 maternal line chromosomes and 16 chromosomes taken from her stock of haploid spermatozoa. The importance of the queen as the reproductive resource of the colony explains why for most of her life after mating she will remain safe within the brood area of the colony. Her every need will be met by her retinue of workers until such time as she is motivated to swarm and found a new colony, or until she dies. In other species, most notably the solitary bees, queens have other tasks to do, such as nest building and foraging. They may hibernate over winter in contrast to the colonial honeybee in its warm cluster of workers inside the nest. This simplified introduction sets the scene for some questions about the role of pollinators, and how an understanding of the reproductive processes in play offer scope for future research.

Pollen grains are the male gametes of flowering plants, equivalent to spermatozoa. For pollination to take place a pollen grain needs to be transferred to the female sex organ of a flower. Flowers vary in form and function according to species. They may be male, female or both, self-pollinating or cross-pollinated. Wind-pollinated plants will be adapted to broadcast their pollen, for it to be blown to female flowers with suitably modified anatomy. Insect-pollinated flowers have evolved features to attract insects to transport the pollen. These pollinators will then continue their exploration of other flowers, in the process transferring some pollen to the stigmas, when the fascinating event of fertilisation and seed production can take place. Not every pollen grain fertilizes an ovule, so there is a considerable surplus of pollen. Surplus pollen has one important additional characteristic – it happens to be a very useful foodstuff.

Pickard's simple beekeepers' calendar of monthly flowering (see page 87) is an invaluable reminder of what pollens they may expect their bees to collect month by month. It is then fine-tuned with local knowledge of what is about and has been seen in flower. Incoming pollen can be checked against pollen colour charts, and checked in more detail by microscope where that is required. This idea would lend itself well to the study of other pollen-collecting bees, or indeed any pollinator which had been dusted with pollen during its foraging or feeding.

When ancestral insects began to fly they became a resource for many organisms, a vector for plant gametes, and also a transport system for smaller organisms such as mites, a potential means for spreading pathogens such as viruses, fungi and bacteria. There developed a specific bee nest ecosystem of invertebrates which benefited from the bees food stores and breeding cycle; for example, cuckoo bee species, endo-and ectoparasites, wax moths, terrestrial

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mites, collembola and beetles.

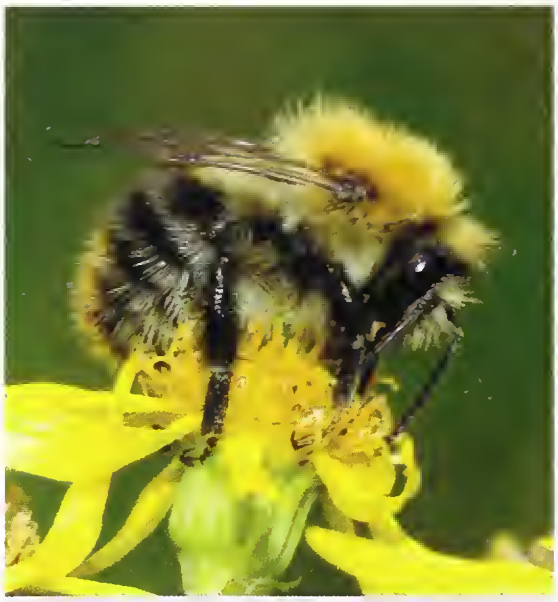
Reproduction in Flowering Plants
Sexual reproduction in flowering plants achieves genetic variation in the gametes and thus in the fertilised ovule and thus the seed. This process is a good deal more complex and interesting than time allows me to detail here. Furthermore plants may have asexual methods of reproduction too.

Flower Adaptation
In order to achieve variation through pollination, a plant has had to adapt its habit and floral morphology. With the exception of wind-pollinated plants, this will have taken place in step with the parallel evolution of its pollinators, be they bees, bugs, beetles, butterflies or birds. A wild flower will have developed its characteristic colour, anatomical structures and features (see page 90), sometimes "deceptive", such as nectar or scent in relation to its potential insect pollinators. Seasonality is another important aspect here, as flowering times and pollinator life cycles have a close association. These characteristics are sometimes lost when humans start to breed plants for other features. Beekeepers often comment on diurnal variation in the opening of flowers and the release of nectar, often linked to the daily rhythm of pollinators.

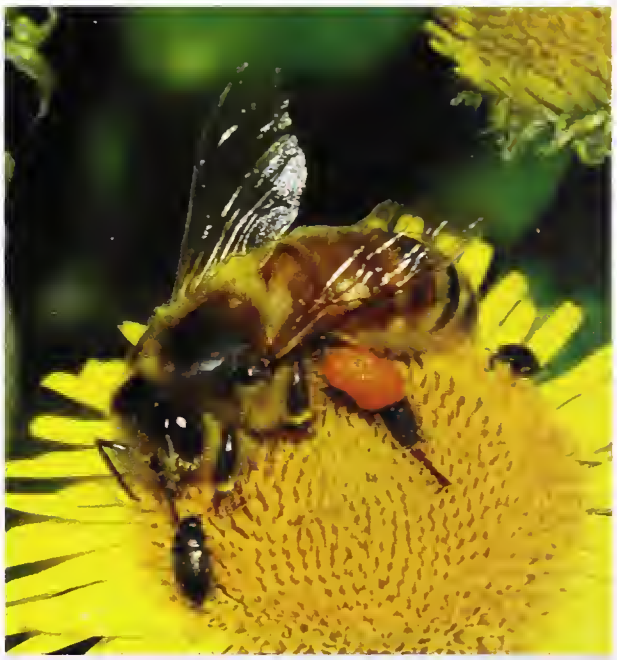
Pollinator Evolution 1
In turn, pollinators have had to evolve adaptations which will enable them to feed on what the plant is offering as bait, that is, the ability to collect pollen as a source of protein or nectar as a source of carbohydrates. Alternatively, the flower may simply provide a convenient place for the pollinator to live. A simple starting point is the flower as a micro-habitat. We have all noted bugs, weevils, flies or moths on flowers, using flowers for concealment or shelter. Do any plants exhibit morphology that seems to encourage casual visitors that might by chance perform some pollination? It is possible to suggest the steps that might lead from a basic commensal relationship to a true association of mutual benefit to plant and pollinator.

Flower Evolution
Flowers have evolved a variety of strategies to "advertise their wares" to would-be pollinators. They display colours and designs, conspicuous in the visible and non-visible spectra [UV]. You may for example have encountered insects trapped in a plant like wild arum, captive until they have performed their work. Here warmth is also used as a lure to the trap. Flowers may produce a scent to attract, sweet, pungent, or putrid, and this may well be targeted at particular pollinator species. Then there is the bait itself, which may be contained in a structure that has itself evolved to suit the size, shape and anatomy of specific pollinator species (see page 90).

Pollinator Evolution 2
Consequently pollinators will have evolved in parallel to suit the flower species they favour, in anatomy, behaviour and in the case of social insects such as honeybees, life as a "super organism". Within the aculeates, for example, there is a range of specialisation to be seen from solitary species through to true colonial bees and wasps, and considerable variation within these. The adaptations of the colonial species include work specialisations for particular



Bumble bee on composite
Picture Jill Hall

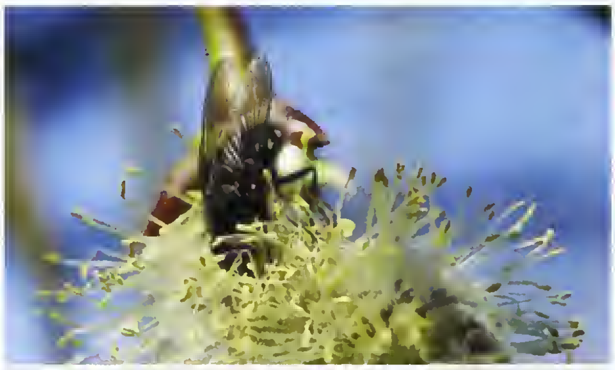


Pollen baskets filled
Picture Jill Hall

Mining bee
Picture Kay Heath

Bumble bee on knapweed
Picture Madeleine Wapplington

Pollen beetles as potential pollinators
Picture Madeleine Wapplington



Diptera as potential pollinators
Picture Madeleine Wapplington

casts or ages of worker, relating to reproduction, management of stored food and strategies for overwintering.

Michael Archer and Alan Phillips' important work on the county's ants, bees and wasps has shown the range and diversity of aculeates that can be found in Lincolnshire. This raises interesting questions about habitat-management based on associations between known or potential pollinators and their forage plants. For example, how do we manage the habitats and plants of a nature reserve to protect and encourage the rarer species of pollinators? We need to know a good deal about the associations between pollinator and plant species to when planning habitat management work. We also need to be aware of and understand the following issues.

Associations
To what extent do the forage plants determine the pollinator species you can expect to find in a given habitat? What are the key plants which would predict the presence of any associated pollinators? Or put the other way, are there any pollinator species which might be predictors of important plant species?

Competition
Some biologists have suggested the possibility that "super-organisms" such as honeybees may overwhelm populations of scarce and possibly vulnerable minor pollinators. It may well be the case that big pollinator colonies concentrate on big producers of nectar and pollen. Reports from beekeepers suggest that honeybees tend to concentrate of major nectar and pollen producers and they do not trouble to work some of the more specialised plant species, to which the rarer pollinator species may be specifically adapted.

Predicting pollinator abundance
We might expect floral abundance and its associated impact on nectar, pollen and habitat to be predictors of pollinator abundance. Could floral diversity be associated with pollinator diversity? [Potts et al. 2001]. Simple pyramids of number or biomass can be used to model the ecological relationship between pollen and nectar sources, pollinator numbers and predators where this information is known. Nectar and pollen supply varies across the seasons, so available carbohydrate and protein will vary and determine the biomass of nectar feeders that can be supported. In times of low nectar production, competition between nectar and pollen feeders may be significant. Those species that "bank" their pollen or nectar can minimise the risks.

The Honeybee
I have been using the well-researched honeybee, *Apis mellifera*, to illustrate the elements of what I shall term a pollination triad, to illustrate the relationship between pollinators, host plants and their environment.

The Pollinator
A colony of honeybees typically comprises 1 queen, up to 80,000 female workers and during the foraging months about 200 drones, the males. Because of the integrated specialisation to be found with the colony, the term "super-organism" is sometimes used. A queen may live for several years. A virgin queen mates at 7-10 days old on mating flights and sperm thus harvested is

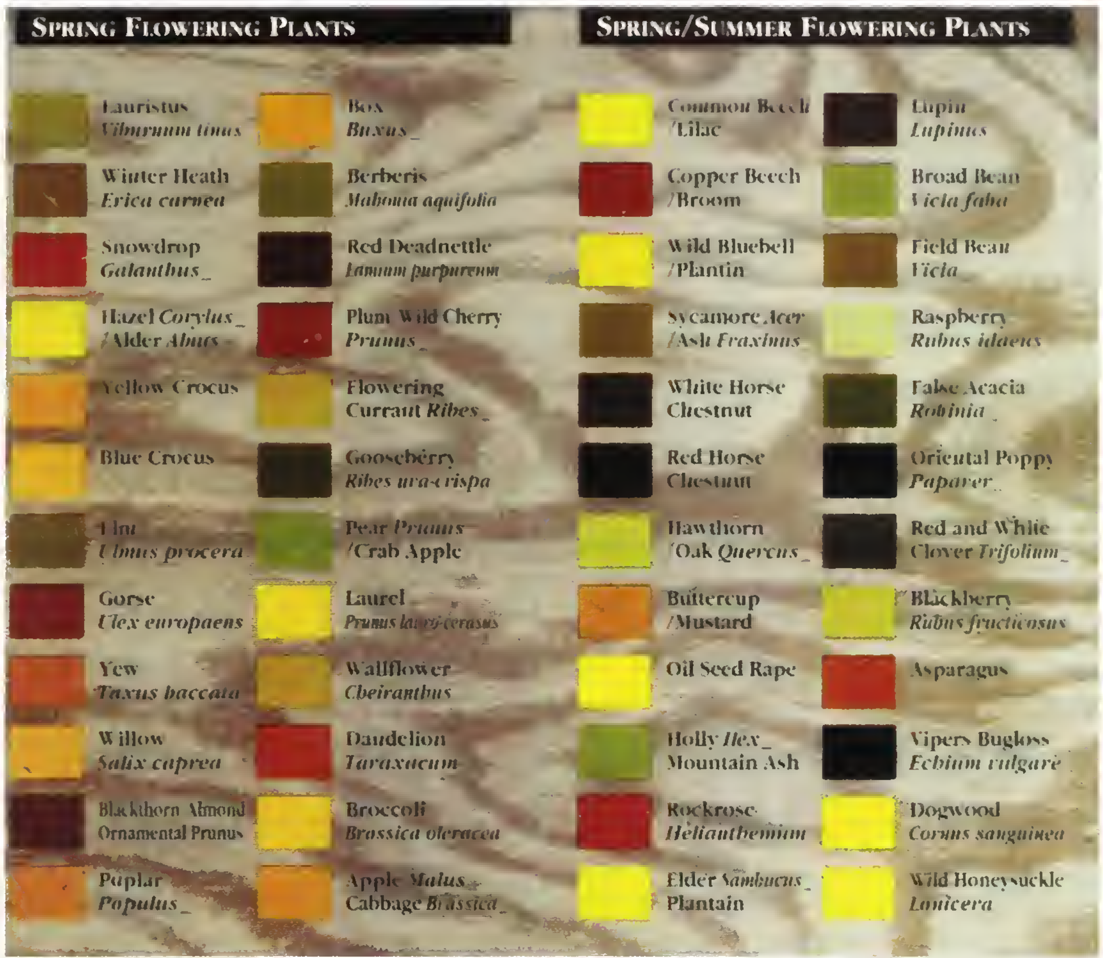
stored to be used during her breeding life. She may lay >2000 eggs per day at peak. Workers, in contrast, may only live 6 weeks during the foraging season, literally working themselves to death. They change their role within the colony over their lifetime as follows: 1-2 days, clean and polish cells; 3-6 days, feed older brood; 6-10 days, feed younger brood; 8-12 days, feed and groom queen; 11-18 days, house cleaning; 12–18 days, make wax and build combs; 18-20 days, guard duty and 21 days onwards, foraging for pollen, nectar, water and propolis.

Foraging radius for workers is approximately 2 flying miles. Each trip lasts about an hour and can involve visiting several hundred flowers. A pound of honey is produced from visits to some 15 million flowers! In a season workers can collect 100 lbs pollen and 400 lbs honey. It is said that bees fly about 55,000 miles to make just one pound of honey, equivalent to 1½ times around the world! Drones, male bees, do no work in the hive, their only role is to mate. Mating typically takes place from April to August in drone-assembly areas between noon to 4pm. Drones die after mating. The Queen's fertilized eggs produce female offspring, her unfertilised eggs males. Workers have a father and mother, drones no father.

There is a much to be learned by examining the entrance to a hive or wild colony. I strongly recommend the little book by Professor H. Storch, "At the Hive Entrance" which sets out activities to be observed and inferences to be drawn. The colony will be busy or not according to weather conditions, time of day and season of year. There will be clues to the health and vigour of the colony, the temperament of the stock and the work being undertaken at the time. Dead bees are carried out of the hives and may be seen at the entrance, a normal housekeeping task, but an increase in the numbers is a warning sign that something may be wrong. Crawling bees may be suffering from parasitic tracheal mites. Signs of wing deformities or paralysis may indicate virus infections carried by the Varroa mite. Direction of outgoing flights may give a clue to the food crop currently being worked. Colour of the pollen baskets on returning bees will often confirm the target flowers.

Bees need to navigate and orientation flights are an important activity for solitary and colonial bees. They need to be able to get back to their base from a wide foraging radius, 2 -3 kilometres being the usual distance quoted. Once orientated, bees make use of a variety of senses to maintain a knowledge of their own position in relation to their hive. One such aid to navigation is a pheromone produced by a gland at the end of the abdomen. Bees can be seen "sending" at the entrance, producing a scent trail home that others can follow. Bees forage for nectar, rich in sugars, which is concentrated into honey and provides the main energy source for the colony. Surplus honey is the store that the colony feeds on over the winter. It is worth mentioning that bees will also feed on sugary fluids produced by guttation from the leaf or stem surfaces on some plants, for example maize, and will also collect "honeydew" exuded from aphids. They will also raid other colonies, a disconcerting vice that beekeepers wish to avoid. Other bee species, and wasps in particular, will raid honeybee colonies to steal their stored honey.

Honeybees also collect a resinous substance known as propolis, a sticky



SPRING FLOWERING PLANTS

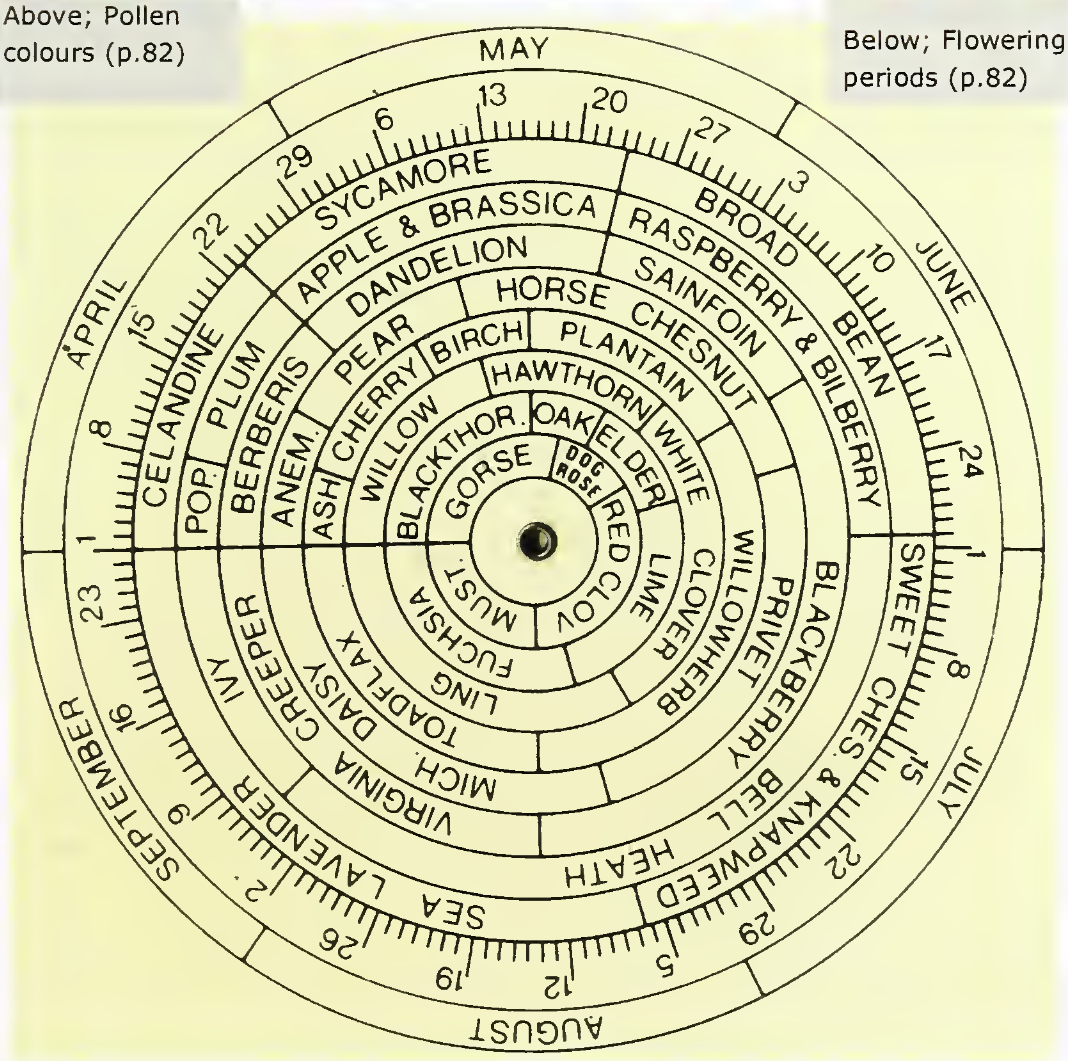
- Lauristus *Viburnum tinus*
- Winter Heath *Erica carnea*
- Snowdrop *Galanthus*
- Hazel *Corylus* /Alder *Alnus*
- Yellow Crocus
- Blue Crocus
- Elm *Ulmus procera*
- Gorse *Ulex europaens*
- Yew *Taxus baccata*
- Willow *Salix caprea*
- Blackthorn Almond Ornamental Prunus
- Poplar *Populus*
- Box *Buxus*
- Berberis *Mahonia aquifolia*
- Red Deadnettle *Lamium purpureum*
- Plum Wild Cherry *Prunus*
- Flowering Currant *Ribes*
- Gooseberry *Ribes uva-crispa*
- Pear *Prunus* /Crab Apple
- Laurel *Prunus lauro-cerasus*
- Wallflower *Cheiranthus*
- Dandelion *Taraxacum*
- Broccoli *Brassica oleracea*
- Apple *Malus* Cabbage *Brassica*

SPRING/SUMMER FLOWERING PLANTS

- Common Beech /Lilac
- Copper Beech /Broom
- Wild Bluebell /Plantin
- Sycamore *Acer* /Ash *Fraxinus*
- White Horse Chestnut
- Red Horse Chestnut
- Hawthorn /Oak *Quercus*
- Buttercup /Mustard
- Oil Seed Rape
- Holly *Ilex* Mountain Ash
- Rockrose *Helianthemum*
- Elder *Sambucus* Plantain
- Lupin *Lupinus*
- Broad Bean *Vicia faba*
- Field Bean *Vicia*
- Raspberry *Rubus idaeus*
- False Acacia *Robinia*
- Oriental Poppy *Papaver*
- Red and White Clover *Trifolium*
- Blackberry *Rubus fructicosus*
- Asparagus
- Vipers Bugloss *Echium vulgare*
- Dogwood *Cornus sanguinea*
- Wild Honeysuckle *Lonicera*

Above; Pollen colours (p.82)

Below; Flowering periods (p.82)



substance obtained from tree buds and bark, which can be used to waterproof and seal their nest from unwelcome draughts. Pollen is the colony's source of protein. A bee's body becomes flecked with pollen grains during the course of its work, and some of these will be transferred from the anther [male part] to the stigma [female part], during nectar or pollen collection. This completes the process of pollination, after which the extraordinary hidden microscopic process of fertilisation takes place. This is a botanical story to be explored at a later date. Suffice it to say this it is the successful outcome that the plant required. All evolutionary adaptations to attract the pollinator and achieve pollination, shape, colour, markings, scent, biorhythms, have come together to lure in the bee.

In turn the bee has evolved to make use of the bait, with a long proboscis to reach down to the nectaries in the flower and "pollen baskets" (see page 84) formed from specialised hairs on the back legs, to carry the load securely. There are behavioural adaptations at work here too. Many bees concentrate on working one species of forage plant at a time, and may opt to collect nectar only or pollen only, or both. An observer at the "hive step" hopes to see bees arriving back with all the signs of a successful foraging. The colour of the pollen baskets (see page 88) can be used to identify the probable species of pollen. A handy guide is produced for beekeepers rather like a paint colour chart. Knowing what plants are in flower locally it is usually possible to make a field identification which can be confirmed under the microscope later. How do you know where to go? A super-organism needs a means of communication. Bee-keepers have long known of the dancing bees, and their "waggle dance" that communicates information on direction and distance. The figure-8 waggle can often be spotted when handling the combs. Together with the exchange of chemical information, this gives fellow bees the information they need to locate the appropriate flowers. The use of the sun for navigation, and also a magnetic sense, allows the foragers to act on this directional data.

Bringing home the nectar/pollen

Nectar is unloaded to a fellow worker on arrival, to enable a quick turn round for the forager. It is regurgitated from the "crop" and taken in to be fed to brood or other bees, or stored. Pollen, being sticky, is more difficult to handle than liquid nectar, which can be passed across quite easily. Pollen is taken straight to the storage cells. The worker simply backs up and grooms its pollen load into the cell. The pollen is then tamped down to make it smooth, either by the forager or a forager's mate! There are solitary bees that store pollen in a similar way, species of Andrena for example. A note should always be made of any pollen-collection evidence seen, linking the associated plant and insect species. Preferences may be observed.

Water

Bees need water to drink and dilute honey before feeding. Colonial species may need a lot of water for temperature regulation in hot weather, fanning the droplets with their wings to speed the rate of evaporation, maintaining the brood area at an optimum temperature. In arid parts of the world some idea of local bee populations can be obtained by observing wet ground near wells. Spills may be a welcome source of water and will lure in foragers. This is especially important for colonial bees needing to thermo-regulate.

In 2011 I carried out a desk top exercise on my local OS map, TF 25/35 and 26/36 to estimate the distribution of apiaries and colonies over a 120 square kilometre area. I found that had colonies been evenly-spaced, that is feral as well as managed stocks, honeybees would have been able to reach almost every square in the sample area. In reality, distribution is skewed towards the location of beekeepers as you might expect, much as species distribution reflects the presence of biologists on the ground! Randal and Sheppard's 2007 paper speaks of a need to "control influxes of honeybees from nearby land" with reference to nature reserves. All SSSIs, LNRs and LWT reserves within the sample area could be reached by bees working to a 2-3 km radius, which they can fly quite easily. Dr Simon Potts [CAER] observes that there are few corners of the UK which honeybees can't potentially reach. His view is that it is the bee density which is the issue and suggests it would be worth attempting to predict and then measure foraging honeybee density in relation to known colony locations.

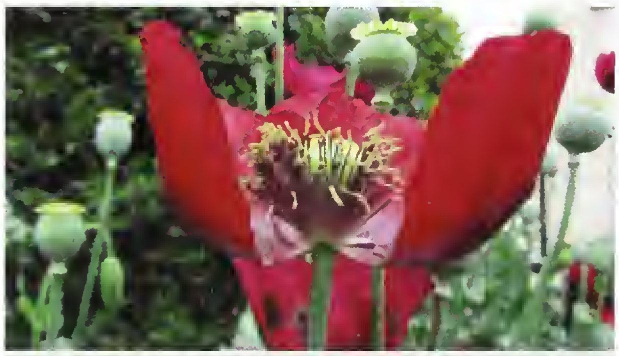
Like honeybees, other species of pollinator will have their own population density, a radius of foraging, daily rhythm of activity, and plants with which they can be associated. Some may have adapted to specific food plants, others may be more flexible about the plants they can feed from. All will have a life cycle that has evolved to take account of the plants available. Broad spectrum species like the honeybee will raise brood most of the year, whilst bee species with a narrow spectrum of food plants may only raise a single brood a year. Current thinking is that diversity of pollinators is necessary for effective pollination. The super-organisms of colonial bees can perform substantial feats of foraging and pollination, especially in relation to agricultural and horticultural crops. However, the more subtle, less-recorded pollinators, are perhaps more finely tuned to wild plant species, and may well be more efficient and effective at pollination. One view is that sometimes the action of pollinators may be complementary, with the major colonial pollinators like the honeybee transferring pollen in quantity and with secondary pollinators spreading the grains about within the flower, thus increasing the odds of every stigma receiving pollen grains.

Where pollinators exist together there is some limited evidence that this may be deleterious to some of the species. Goulson and Sparrow have found evidence of smaller body size in workers of several bumblebee species when in competition with honeybees. *Bombus pascuorum, B. leucorum, B. lapidarius and B. terrestris* all showed this effect, and the inference was drawn that where more rare or vulnerable species were in competition, for conservation purposes it might be best to keep apiaries away from such populations. Given the range that honeybees forage, this is a difficult guideline to meet. Current research in the USA, carried out in the aftermath of CCD, emphasises the importance of wild pollinator complimentarity in the commercial pollinating process. It seems that diversity provides a vital boost to pollination efficiency here and it is reasonable to expect that principle to apply in the wild.

What is the scope for further research?
I recommend naturalists read the excellent summary of The Lincolnshire's Aculeates, the Bees and Wasps and related LNU books and papers on beetles, flies and lepidoptera. There is a wide range of insects which visit flowers (see

Cretaceous bee fossil (p.91)

Cupid robs a 'skep' (p.91)



Evolution of floral parts (p.83)
Picture Ann Parsons

Bumble bee mating cluster
Picture Madeleine Wapplington

Moths as potential pollinators
Picture Roy Harvey

Butterflies as potential pollinators
Picture Mick Binnion

pages 84 & 90). Many of these are difficult to identify to species from photographs alone, so observational skills such as microscopy will sometimes be needed. It is the usual expedition into taxonomy, starting with the better known easy-to identify species and advancing into unfamiliar territory. The associations of pollinators with food plants makes it necessary to bring botany into the work, and to start to record not only the flowering plants on which insects are noted but, where practicable, to identify the pollen that has been collected. To start with the simple colour chart approach can be tried, but microscopy is the route that will eventually need to be followed to confirm identification. Speaking of identification, I was pleased to be reminded by Charlie Barnes of the invaluable role played by bees in the life cycle of oil beetles. It underlines how very useful it had been to have air transport available in the natural world. He writes of oil beetles: “They seek out bare ground to dig burrows in which the females lay their eggs and can often be found on footpaths where the soil has been compacted by walkers. Once the eggs hatch, the larva lay in wait on flowers where they hitch a ride on an unsuspecting bee. They get carried to the bee's nest where they disembark and proceed to eat the store of pollen and nectar and the bee's eggs.”

Bees have been on earth for around 120 million years (see page 90). Hunter-gatherer humans will have robbed bee colonies for honey for thousands of years. For a few thousand years honey bees have been deliberately encouraged to occupy artificial hives to make honey gathering easier. At what stage wild honeybees returned to the British Isles after the Ice Age is a matter for conjecture, but we can be certain that the Romans had knowledge of honey-bee management. The picture on page 90 is evidence of this knowledge, a woven “skep” full of bees.

Wild Honeybees have been part of our countryside for over 2000 years. Only when humans started to practice artificial selection can we say that they became domesticated. Domesticated and feral bees can reach almost every part of the UK mainland and in doing so they interact with wild and agricultural plant species and many species of wild pollinators. The more we can discover about these interactions, the more informed our decisions will be in conservation and agriculture.

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Other useful websites:

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Alan Dale's Bugs and Weeds. http://www.bugsandweeds.co.uk/
Mike Binnion: Common Butterflies
http://www.grimsbywildlife.co.uk/otherattractions.htm
http://www.grimsbywildlife.co.uk/
Lincolnshire Wildlife Trust species pages: http://www.lincstrust.org.uk/species/index.php

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Roger J. Parsons – March 2013

BUGLIFE'S SCUNTHORPE STEPPING STONES FOR WILDLIFE PROJECT

Clare Dinham

Brownfields are very unique habitats, and the distinct nature and qualities of these sites means they can be very rich in invertebrates and other wildlife such as reptiles and amphibians. Brownfields are sites that have been altered by human activity; often this activity creates features that form a mosaic of habitats within a small area, allowing a rich variety of wildlife, and particularly invertebrate species, to coexist together. This high invertebrate richness means that brownfields can have as many Red Data and Nationally Scarce invertebrate species associated with them as do ancient woodlands.

Within the landscape the presence of brownfield habitats can be of vital importance as 'stepping stones' and refuges for wildlife as the microhabitats they contain have become rare and fragmented in the wider countryside. The important role that brownfield sites play in supporting biodiversity is becoming more and more recognised and understood, and Open Mosaic Habitats on Previously Developed Land (OMHoPDL), i.e. brownfield, was added to the UKBAP as a Priority Habitat in 2007 and has subsequently been adopted by many Local BAPs. Brownfield sites are under increasing pressure from development resulting in OMH being lost at an alarming rate (i.e. in the Thames Gateway where 39% sites containing OMH have been lost in the last 5 years). To gain a better understanding of these habitats which can vary greatly from region to region, Buglife is undertaking a number of Stepping Stones projects across the UK to learn more about the invertebrates and other wildlife these sites can support, working with partners to manage them appropriately.

The Scunthorpe Stepping Stones for Wildlife project, funded by landfill grant giving body the SITA Trust, is working in partnership with Humber INCA, North Lincolnshire Council (Ashbyville LNR, Sawcliffe LNR, Conesby Quarry and Blue Lagoon), Lincolnshire Wildlife Trust (Messingham Sand Quarry SSSI) and Tata Steel (Scunthorpe) to identify and conserve the wildlife found on their sites.

Primary aims, methods and outputs of this 3 year project, due to be completed in March 2014 are as follows:

- Collate baseline biodiversity data in Year 1. Invertebrate surveys focusing on Diptera, Hymenoptera, Coleoptera, Lepidoptera and Aranae. These surveys were completed in 2011.

- Restore and enhance brownfield habitat in Years 2 and 3 based on the findings of the baseline data to mitigate against the on-going loss of OMH UK BAP Priority habitat and to help secure the future of its threatened biodiversity.

Habitat management work carried out across the project sites has included:

- Selective scrub clearance and woodland thinning to promote the establishment of species rich grassland and ground flora, respectively. Brash has been used to create wildlife piles for invertebrates, reptiles, amphibians and small mammals.
- Creation of bare ground scrapes and south facing bee banks providing microhabitats for invertebrates and reptiles. Disturbance is very important for maintaining Open Mosaic Habitat (see page 96); small patches of bare ground are ideal for basking and burrowing invertebrates such as solitary bees and wasps and basking reptiles as they provide habitat that will heat up rapidly in the sun. Exposing these typically shallow, low nutrient substrates allows open sward grassland and lichen and moss communities to establish, as more competitive species are unable to dominate.
- Creation of wildflower rich grassland to improve forage and nectar resources for invertebrates
- Bracken control
- Biodiversity monitoring of habitat management and creation/ enhancement work was completed at the end of August 2013 and the results are currently being compiled.

Additional aims of the project are to:

- Raise awareness about the importance of brownfield habitats for wildlife.
- Feed into site management plans and species/habitat action plans where applicable.

- Brownfield biodiversity resource mapping in the Scunthorpe area to identify sites containing UKBAP OMH Priority Habitat. This information will be used to identify which Local Authority owned brownfield sites play a strategically important role in providing connectivity between the project sites, as well as other brownfield sites, green space, LNR's, SINC's and SSSIs. The data will also highlight sites that have the potential to support UKBAP species such as grayling *Hipparchia semele*.

A brownfield workshop aimed at Local Authority planners, ecologists, consultants, developers and land managers was held at Whisby Nature Park in October 2013. Based on the findings from this project the workshop provided an overview of the importance of brownfield sites in the region, the UKBAP OMHPDL and species associated with these varied habitats. Habitat management and creation case studies, survey methods, best practice, and planning policy were also covered.

Scunthorpe Stepping Stones for Wildlife Project Case study – Tata Steel

Tata Steel is a vast site of approximately 1200ha situated to the east of Scunthorpe. Due to the industrial processes that have taken place on site dating back to the 1800s, coupled with lack of management and cycles of disturbance and abandonment, the site currently supports a diverse mosaic of habitats including bare ground/low growing early successional vegetation, species rich grassland supporting neutral, calcareous and acidic species, scrub, secondary woodland (dominated by silver birch), wetlands, lagoons, ponds and ditches. As such Tata Steel is among the most biodiverse brownfield sites within Lincolnshire. Humber INCA (a private not-for-profit company which works alongside industry around the Humber Estuary to promote nature conservation and environmental compliance, and of which Tata Steel are a longstanding member) carried out an extended Phase 1 survey of non-operational areas across the site in 2010 and 2011 and found the site to support protected species such as great crested newt *Triturus cristatus*, common lizard *Lacerta vivipara*, water vole *Agricola amphibius*, badger *Meles meles*, bats, kingfisher *Alcedo atthis,* peregrine falcon *Falco peregrinus* and 300 species of plant. Thanks to Humber INCAs relationship with Tata Steel, Buglife were granted permission to carry out invertebrate surveys in a number of non-operational areas, and will pass invertebrate data to Humber INCA which will contribute to the conservation management of the site.

Survey results

The results to date indicate that the project sites are supporting robust and interesting assemblages of common, local and regionally scarce species, which is particularly evident at Tata Steel. High numbers of grayling were recorded on site and the population of this UK BAP species is of regional significance due to the numbers present. Grayling is found on sunny and dry sites with areas of open bare/sparsely vegetated ground, areas of which are abundant across the steel works. Roesel's bush cricket *Metrioptera roeselii*, recorded in similar habitat to the grayling, is one of the most northerly records reported in the UK (along with a record at Spurn Head).

One of the many interesting finds included the ruby-tail wasp *Chrysis viridula* recorded in a former sand extraction area of the steel works (known as the Sand Martin Wetland), which is only the second record for north Lincolnshire in 30 years. This species is known as a cleptoparasite or 'cuckoo wasp' which lays its eggs in the nest of a solitary bee, usually a mason bee. When the ruby-tail larva hatches it eats the mason bee larvae and any prey that had been brought into the nest.

Moths at Tata Steel

In 2011 four moth surveys were carried out at a number of areas at Tata including habitats such as heathland, woodland, wetland, open sandy areas and grassland. 212 species of moth were recorded as part of this survey including numerous rare and scarce species.

Tata Steel, Sand Martin area (p.97)

Picture Clair Dinham

Tata Steel, Sand Martin area work party (p.97)

Picture Clair Dinham

Tata Steel, Lichen Heath (p.94)

Picture Clair Dinham

The study provided many interesting results such as Kent black arches *Meganola albula* , a nationally notable species. Kent black arches is typically a southern and eastern coastal species, with its most northerly location at Spurn Point. The presence of this species in Scunthorpe demonstrates the importance of brownfield stepping stones throughout the landscape, aiding species movement.

The species list for 2013 is currently being compiled. However some indicative species of note include the citron plume moth *Euleioptilus carphodactyla*, a local species, restricted to a few south coastal areas, which has gradually increased its range northwards as far as South Yorkshire; mere wainscot *Chortodes fluxa*, occurring in parts of southern, central and eastern England up to Yorkshire, with only a handful of sites known in Lincolnshire from the last Butterfly Conservation macro atlas; the annulet *Charissa obscurata,* a species inhabiting heathland, well drained stony areas and coastal locations, which is fairly widespread throughout Britain, but scarce in Lincolnshire with reference to the last Butterfly Conservation macro atlas; and *Eucosma pupillana*, an uncommon species with a mainly southern distribution.

Habitat Management, Crosby Warren area

Prior to extensive residential and commercial development, large areas of Scunthorpe supported coversands heath habitat. These days, only small remnant areas of coversands remain, some of which are scattered in small patches at Tata Steel. TCV (The Conservation Volunteers) work parties have been carried out in the Crosby Warren area of the steelworks, an area, to protect one of these remnant patches of heath by felling some of the adjacent scrub and birch woodland, which is dominant across the site. Contractors were also brought in to successfully manage the encroaching bracken. Earlier this year a digger was brought in to scrape away the dead bracken material into mounds, exposing the underlying sand. Open patches of sand remain providing burrowing and basking areas for invertebrates, with species such as weld *Reseda luteola*, great mullein *Verbascum thapsus* and viper's bugloss *Echium vulgare* now establishing.

Sand Martin Wetland area

This area of the site is where sand is extracted for industrial processes. Part of this section is no longer worked and an ephemeral wetland and calcareous flora has developed supporting species such as yellow-wort *Blackstonia perfoliata*, common centaury *Erodium cicutarium* and blue fleabane *Erigeron acer* along with *Juncus spp*, *Carex spp* and *Phragmites.* In the spring of 2011 Buglife, Humber INCA and a team of Tata Steel staff volunteered their time to re-face part of the sandy cliffs, making the face almost vertical, (see page 96) benefitting nesting sand martins *Riparia riparia* and solitary bees and wasps. Using a digger, small areas of bare ground were also created and the arisings used to make two bee-banks. The presence of bee-banks adds topographical variation and creates minor differences in micro-climates thereby increasing habitat niches for a variety of invertebrates. Sand continues to be extracted periodically in this general area creating new sandy cliffs in the process, providing habitat at different stages of succession.

THE WHATMOUGH COLLECTION OF SPIDERS

Annette and Allan Binding

In 2012 we received a grant from the Lincolnshire Biodiversity Partnership to cover the cost involved in researching the Whatmough Collection of Spiders. A random sample of the tubes in the collection, the reports in Transactions and the record cards had shown that much of the data from these sources was not on the spider database.

George W. Whatmough became Lincolnshire County Recorder for Spiders in 1948 and wrote reports in the Lincolnshire Naturalists Union Transactions between 1950 and 1970. Although he continued to record spiders up to the 1980's, he wrote no further reports.

We began our research with the record cards as much of the work had already been done on them and this formed the basis of the information from the collection. Every card was checked and any missing data was added to the database.

Next, every record from the Transactions was written on to recording forms. There were a total of 413 records and new information was added to the database from the majority of them.

Finally all the specimens in the tubes were listed onto the recording forms and this data was also put onto the database. There were approximately 985 tubes (see page 101). These included 77 specimens from foreign countries. Of the remaining 900 or so, 374 were not on the spider database. This number was made up of 193 from Lincolnshire, 136 from other counties in Great Britain and 45 from the Channel Islands. Just over 530 were already on the database but new information such as the number or sex of the specimens or names of collector and determiner were added to about 75% of them. When the input of data was complete it was possible to extract information about and from the collection. We discovered that the oldest specimen in the collection was a female *Zygiella x-notata* from Mablethorpe dated December 1947 and although there were a few specimens up to the mid-1980's, the majority of the specimens were from the 28 year period from 1951 to 1979.

Among the specimens there were seventeen species which are nationally rare. There were six from other counties in Great Britain, five from the Channel Islands and six from Lincolnshire.The only Red Data Book 1 (RDB1) specimen, *Gibbaranea bituberculata,* was collected from Jersey in the Channel Islands in 1969 and was identified by G. H. Locket. The only other Red Data Book (RDB) specimen was *Zora armillata* which is RDB3. It was collected in July 1951 at Wicken Fen in Cambridgeshire by Mr E.C. Riggall and was also identified by G.H. Locket.

There were four Nationally Notable a (Na) specimens, one from Lincolnshire and three from other counties. The specimen from Lincolnshire, *Hygrolycosa* *rubrofasciata* , was collected at Linwood Warren in December 1970 by F. R. Pearce and identified by G. H. Locket. It was not reported in Transactions. The three from other counties were *Marpissa radiata* from Wicken Fen collected by Mr E. C. Riggall in 1951, *Maso gallicus* collected from Folkstone Warren in Kent and *Argiope bruennichi* collected from Studland, Dorset in 1962. All were determined by G. W. Whatmough.

The eleven Nationally Notable b (Nb) specimens included five from Lincolnshire, two from other counties and four from the Channel Islands. The five Notable b (Nb) species from Lincolnshire were all collected from Gibraltar Point and include *Philodromus fallax* April 1949, *Marpissa nivoyi* May 1951, *Crustulina sticta* July 1968, *Baryphyma maritimum* May 1966, June 1967, July 1967, May 1970 and *Argenna patula* May 1973. The two species from other counties were *Esinus truncatuspi* from Babbacombe in Devon 1950 and *Pardosa trailli* from Ben Eighe in Scotland, no date given. The four species from the Channel Islands included two specimens of *Crustulina sticta* one from Alderney 1970 and one from Jersey in 1971, *Hybocoptus decollatus* from Jersey in 1990 and *Trachyzelotes pedestris* also from Jersey in 1966.

The small collection of foreign species was very interesting and included specimens collected by Whatmough on his travels as well as specimens collected by holidaying Lincolnshire Naturalists Union Members. Some of the specimens collected in European countries can also be found in Great Britain. The truly foreign species included specimens that had been accidentally introduced to Great Britain with products, often with bananas. These accidentally introduced species included *Loxosceles rufescens* from Kenya, a very poisonous spider also known as the recluse spider or fiddleback spider. There were several specimens from the family Sparassidae. These included two specimens of the brown huntsman *Heteropoda venatoria* from the West Indies, one *Olios sancti-vincenti* also from the West Indies and two *Torania variata* from British Cameroons. All these are large spiders and the specimens are all females. There was also a single specimen of *Phoneutria fera* also called the Brazilian wandering spider which belongs to the family Ctenidae. Whatmough's specimen, a female, came into the country in June 1951. There are eight known species of *Phoneutria* (Greek for murderess) but *Phoneutria fera* is the most poisonous and is often referred to as being the most dangerous spider in the world. It has a body length of up to 2 inches with a leg span of 6 inches. *Phoneutria* are aggressive, fast moving and bite readily. Other poisonous spiders in Whatmough's collection included 3 specimens of the Australian red-back, a relative of the black widow spider. There was also a black widow from Iran although how these specimens came into Whatmough's collection is not stated.

Among the other interesting species in the collection were three specimens of *Gasteracantha* which have spines on their abdomens and are often prettily coloured and marked and three specimens of wasp spider *Argiope sp*, two from New South Wales, Australia and one from Honolulu in Hawaii.

Whatmough's collection of spiders is held in rubber topped glass tubes and over time some of these had perished so as well as extracting the data, specimens in affected tubes, approximately fifty, were re-housed. Despite the fact that some of the specimens are up to sixty years old the collection is presently in very good condition although like other invertebrate collections, it will need checking occasionally.

THE EARLIEST BRITISH SHOULDER-STRIPE EMERGENCE AT WHISBY NATURE RESERVE?

Phil Porter

Arriving at work at Whisby on the 10th January 2012, my first observation of the day was a small dark geometer moth resting on the wall next to the door. I could see straight away that this was a shoulder-stripe *Anticlea badiata* and knew that this was an extraordinarily early date to see one, so I captured an image (see page 101). The abdomen was curled up at the tip in the characteristic pose and the general appearance was well to the darker extreme of the species' range of variation. The weather had been mild and damp leading up to the 10th.

In order to discover just how exceptionally early this occurrence was, I sent the record to Dr. Paul Waring who later commented in British Wildlife that "This is an exceptionally early emergence, especially for the Midlands, where March and April are the usual flight time, with some in February in early seasons. It is also the earliest reliable record of the species on the National Moth Recording Scheme database. The earliest previous records are 20th January 1990 at Coed Nant Llolwyn in Ceredigion, and 26th January 2003 and 27th January 2008, both at Cranmore on the north-west coast of the Isle of Wight."

Was this the earliest natural British emergence for the species or had it been artificially reared nearby? I think it is fair to say that the chances of the latter solution are pretty remote, but one never knows.

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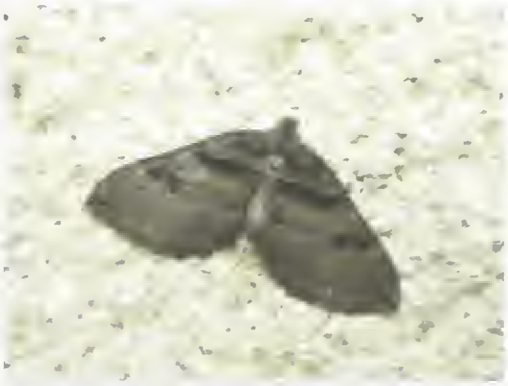
HAWKWEED GALLS

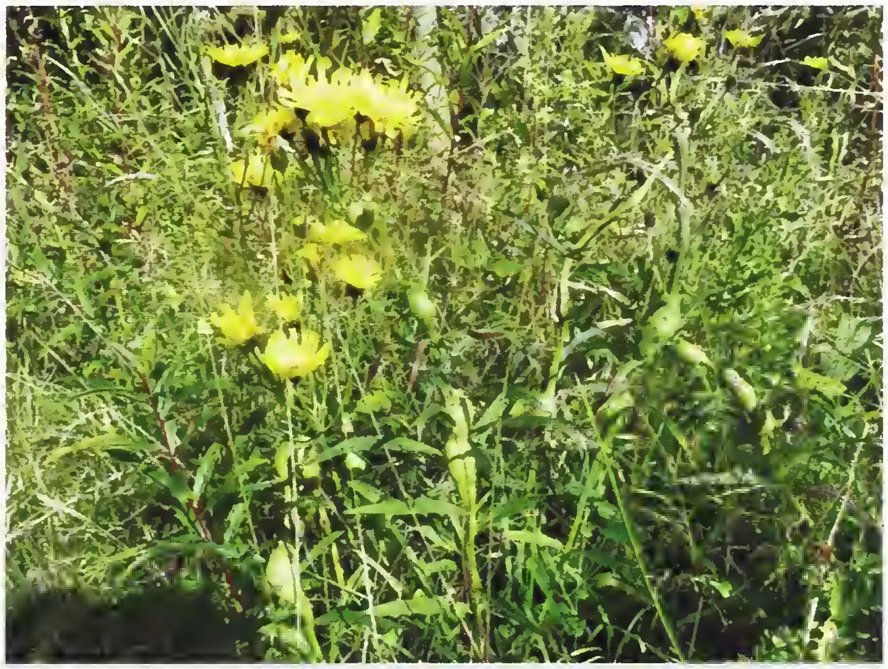
Jan Rousseau

I have found it fascinating looking at plant-galls, but then started to wonder about the insects causing and using them. Some of the best known of the gall-causing insects are the Cynipid wasps. Very small, usually black or brown, they are quite ant-like in their appearance. Not all of them are gall-causers, some are

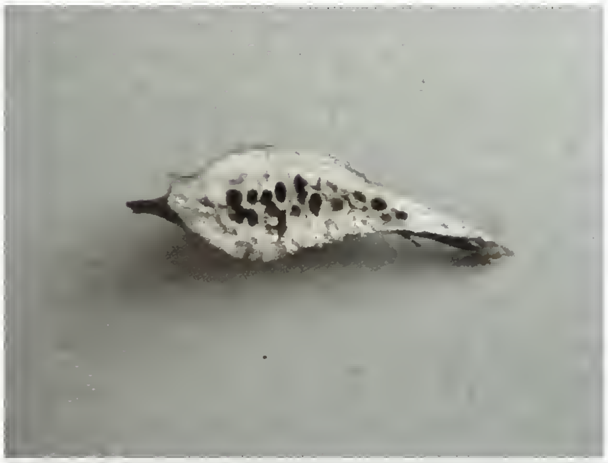
Part of the Whatmough Spider Collection (p.98)
Picture Alan Binding



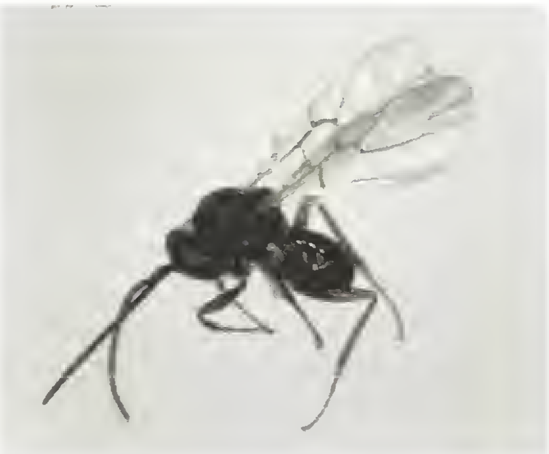
Shoulder-stripe at Whisby 10th January (p.100)
Picture Phil Porter



Hawkeed galls (p.102)
Picture Jan Rousseau



Hawkeed gall in section (p.102)
Picture Jan Rousseau



Aulacidea hieracii (p.102)
Picture Jan Rousseau

inquilines, being happy to place their eggs into an already formed gall. These cause no intentional harm to the causer, but feed on the nutrient-rich plant tissue, which might bring about a food shortage for the causer.

I think that most of the gall causers are species specific in their choice of host plant and also in the placement of the egg(s) on a particular part of the plant. It is when the eggs start to hatch that the host plant begins to create a gall, encasing the tiny larva(e), which feed on the gall tissue and in time pupate inside the gall and eventually emerge as the adult insect.

This potential live-food source does not escape the attentions of predators. Parasitic Chalcid wasps also breed in galls. Some of these are amazingly beautiful, with bright metallic green or bronze colouring. Their eggs are laid inside the gall using their very long ovipositors to pierce the tissues and are placed either onto or into the larvae of causers or inquilines.

I decided to take a closer look at this hidden world and chose the galls on umbellate hawkweed, *Hieracium umbellatum* (see page 101) as my subject. Hawkweeds are a complex family of composites with many microspecies which can produce seed without the need for cross pollination. The microspecies are therefore very similar and from a gall recording point of view are noted as *Hieracium* only. I observed my target plant in four locations at Whisby Nature Reserve where the best plants were found on Magpie Walk. The old galls from the previous year were easy to find with one stem of particular note having six quite large galls still intact. I collected this and counted eighty-one exit holes! The new stems were quite well-grown when the new galls appeared, in late June and early July, as a ‘bump’ in the stem, which had apparently no effect on the flowering of the plant. Over the next few weeks the galls developed into varying sizes from half an inch to perhaps two inches in length and became quite hard. I collected two of these galls in September.

Each gall was kept separately in a pot covered with breathable cotton material, secured around the top by an elastic band and overwintered in the garden shed in order to mimic as far as possible the outside conditions without risking fungal infection, and waited patiently.

In late April I began checking quite frequently for any signs of activity and the morning I was waiting for came during May. Fine ‘sawdust’ in the bottom of the pot! There were fourteen perfectly round holes through which insects had emerged from one gall. These were later confirmed as *Aulacidea hieracii* the gall causer. The second gall proved to have only two inhabitants which were very different from the causer; these were the Chalcid wasp *Eurytoma cynipsea*. The second gall had been parasitized and none of the causers, or any inquilines there may have been, had survived. All of the insects had emerged by cutting perfect round holes through pretty hard gall tissue. Opening a gall myself using a small hacksaw with the gall in a vice, I was impressed!

Inside were masses of tiny perfectly formed chambers where the wasps had pupated with little tunnels leading to the exit-holes. It is amazing to look into the hidden world of such a special community. I am totally hooked and will soon be investigating another example. As a member of the British Plant-gall Society, I am able to call upon the help and advice of its experts. I am so grateful for all the assistance and support given, in particular for identifications of plant-galls by Margaret Redfern and for insect determinations by Robin Williams.

THE CURIOUS CASE OF *Ecdyonurus dispar* (CURTIS 1834) AUTUMN DUN IN LINCOLNSHIRE

Rachel Farrow and Alex Pickwell

Distribution

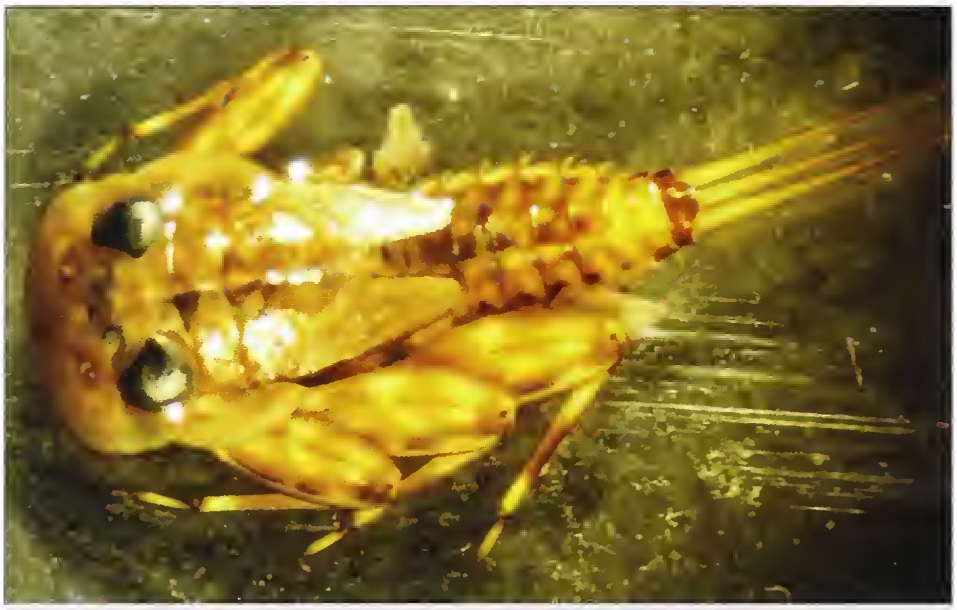
Ecdyonurus dispar (Curtis, 1834), commonly known as the Autumn Dun (Elliott & Humpesch, 2010; Macadam & Bennett, 2010), is widespread and abundant in continental Europe (Illies, 1978). The species is distributed from the Alps in the south to the Baltic Sea in the north and from Spain in the south-west with records from Turkey in the south-east (Bauernfeind & Soldán, 2012). Furthermore, Kelly, Quinn & Regan (2012) described *E. dispar* as a widely distributed species in Ireland. Macadam & Bennett (2010) stated that the challenging nature of larval identification for *E. dispar* has made it difficult to produce a comprehensive UK distribution. It is believed, however, that the mayfly occurs in suitable habitats throughout the UK (Macadam & Bennett, 2010). (see page 104)

Identification

The larvae of *Ecdyonurus* (see page 104) are strongly flattened with a broad head and large eyes positioned dorsally (Elliott & Humpesch, 2010; Macadam & Bennett, 2010). The thorax and femora on the legs are also very broad (Elliott & Humpesch, 2010). Furthermore, *Ecdyonurus* larvae possess seven pairs of gills and backward projections from either side of the pronotum (Elliott & Humpesch, 2010). Confident identification of *E. dispar* larvae (Plate 1) from other *Ecdyonurus* species requires microscopic identification (Macadam & Bennett, 2010). Features that may be used with less confidence than those requiring a microscopic examination include the underside of the body of fully mature *E. dispar* larvae being marked with a dark line along the front of each segment and the feet having a dark band at either end (Macadam & Bennett, 2010), as can be seen on page 104. Confirmation of identification can be obtained by microscopically examining the mouthparts of *E. dispar* larvae, which possess short and round glossa (Elliott & Humpesch, 2010).

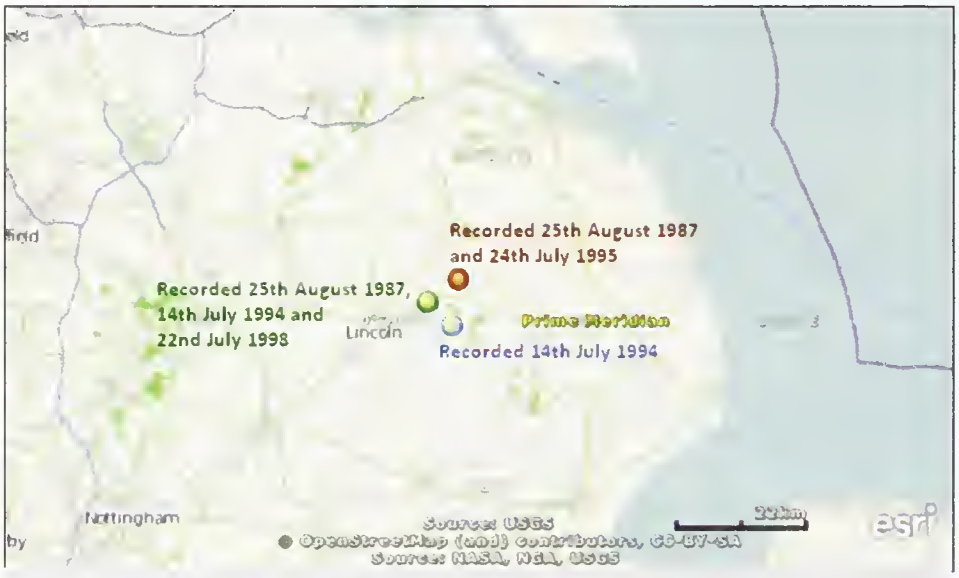
Ecology

E. dispar larvae are generally found 600 metres above sea level on the stony bottom of rivers and streams and occasionally on stony lake shores (Elliott & Humpesch, 2010; Bauernfeind & Soldán, 2012). As a larva, *E. dispar* grazes on algae and is characterised as both a swimmer and a climber (Elliott & Humpesch, 2010). Armitage *et al.* (1968) found that even though *E. dispar* was present in riffles it was more prevalent in pools. Elliott & Humpesch (2010) reported *E. dispar* to be present predominantly in the grayling region with some



A larval specimen of *Ecdyonurus dispar (p.103)*

Picture Alex Lockwood



Dates and locations of recent recordings of *Ecdyonurus dispar* in Lincolnshire. Contains Environment Agency information © Environment Agency and database right and Ordnance Survey data © Crown copyright and database right 2010, and was produced using ArcGIS Explorer software and data provided by OpenStreetMap [Map data © OpenStreetMap contributors, CC-BY-SA]).

representation in the lower trout region and barbel region. These regions relate to the sections of a river where certain fish species are to be found normally (Field Studies Council, no date). The grayling region is generally described as fast flowing with a steep gradient, similar to the trout region, although the temperature is slightly higher.

E. dispar, like other mayflies, is univoltine producing one brood in the summer months, generally between June and September/October during the flight period (Elliott & Humpesch, 2010; Bauernfeind & Soldán, 2012). Larvae are generally 10-12 mm long and can go through 20-30 instars before reaching maturity (Humpesch, 1981). The time between each moult is temperature dependent (3.9-20.3°C) (Humpesch, 1980a) and it is thought that larvae can remain in the pre-adult stage for more than one season (Bauernfeind & Soldán, 2012). It is possible for *E. dispar* eggs to develop parthenogenetically, however the result is lower numbers hatching, as well as fewer (if any) males and reduced fitness (Humpesch, 1980b). *E. dispar* is unusual in that it has a sub-adult/sub-imago phase where it resembles the adult but is not sexually mature (Bauernfeind & Soldán, 2012).

Records

Historic records collected during the operational duties of the Environment Agency and its predecessor the National Rivers Authority have been made available to determine where to begin the investigation of this species (see page 104). *E. dispar* has previously been recorded at West Torrington Beck, Lincolnshire with the species most recently recorded in 1998. Larvae of *E. dispar* were also recorded in 2004 during a field search at West Torrington Beck and one specimen was recorded at Stainfield Beck. However, the species has not been actively sought at either site in recent years.

West Torrington Beck was typically described as two metres wide and varying from 10-70 cm in depth. Stainfield Beck is reported as being larger than West Torrington Beck, being four metres wide but ranging from 10-40cm in depth. Substrate composition was predominantly pebbles/gravel at both sites.

Investigation

A search will be undertaken at the locations where *E. dispar* was previously recorded. From there the researchers will hope to determine where the main population resides and to evaluate the features of that habitat. It is also hoped that the investigation will clarify why *E. dispar* is found in such low numbers in Lincolnshire when the habitat appears to be suitable for this species. Such investigations will include determination of the resident invertebrate assemblage, identification of the aquatic flora and characterisation of the physical features of the habitat including substrate composition.

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BUSH CRICKETS, A FOOD SOURCE EXPLOITED BY KESTREL AND LITTLE OWL

Alan S. Lazenby

In the summer of 2009 I discovered Roesel's bush crickets *Metroptera roeselii* at Blankney Fen. They were by the roadside at Blankney North Drove on the ditch bank and field corner, grid reference TF1262. Blankney Fen is an area of arable fields of approximately 20 sq. km. on heavy soils at an altitude of 2 metres with deep ditches bordering the road and field boundaries, the River Witham to the east and the Car Dike to the west.

Roesel's were seen again in July 2010, May 2011 and later in September three Roesel's adults and five male and one female short-winged coneheads *Conocephalus dorsalis* were present. Later in that year, I was tidying up the path at the side of my nearby house where a number of kestrels *Falco tinnunculus* and little owl *Athene noctua* pellets had accumulated below the soil pipe where they regularly perch.

I picked up a pellet, rubbed it between finger and thumb and saw what could have been mistaken for the long curved front teeth of voles or wood mice, but it did not look quite right. I put ther pellets to one side and later under a binocular microscope I dissected out two ovipositors each of female Roesel's bush cricket and short-winged conehead. The pellets did not contain the heads, legs or wings, indicating that the birds had pulled off these appendages before eating the bodies.

Both species were still present in 2012 and both have extended their range in Britain in recent years (Brian Redman L.N.U. Orthoptera recorder pers. comm.).

FUNGI IN 2012

Ray Halstead

An exceptionally dry spring this year has led to very few sporadic reports of fungi. Several of the Morels, *Mitrophora semilibera*, *Morchella esculenta* and *Verpa conica* were reported, *V. conica* at Toft Tunnel, Horbling Line and Deeping Lakes with thirty-eight, nine and twenty-six fruit bodies respectively.

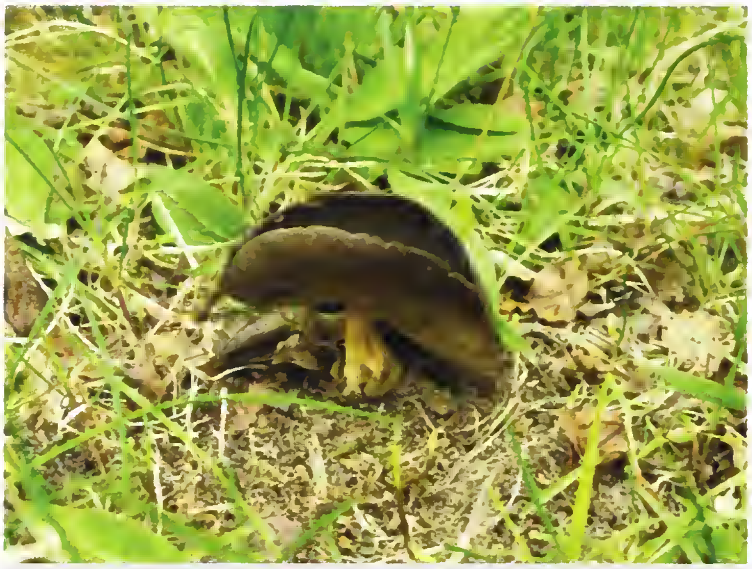
A most notable report in April came to me from John Davison at Messingham Sand Quarry (MSQ) regarding some 'clam-like' fungi that had appeared in two locations at the reserve. Initial photographs were inconclusive so I drove out there to have a look for myself and found what proved to be *Helvella queletii.* (see page 108). Identification was confirmed by Ken Rowland and I then forwarded a specimen to Michael Jordan at ABFG who verified it for us. This is an extremely rare fungus in the UK with only four reported locations, two of which are duplicates and another only 'doubtful', so we are privileged to have two separate colonies at MSQ, one of about seventy-five fruit bodies, the other with about twenty. These two colonies are approximately three hundred metres apart and are therefore completely separate colonies. How long they have been there is unknown but I shall be monitoring them in the future.

At the very beginning of September I paid a visit to our other known rarity in Lincolnshire, *Battarrea phalloides* (see page 108), at Theddlethorpe Dunes. I was again too late to catch it prior to sporulation but was pleased to find twelve fruit bodies in the same location as previous years.

I led four public forays this year the first of which was with the Grimsby Area Group of the Lincolnshire Wildlife Trust at Nettleton Wood, (Forestry Commission), near Caistor at the end of September. This proved to be a good 'starter' for the season with a total of fifty-two species recorded on the day the most notable of which was *Mutinus caninus*, the dog stinkhorn, not a particular rarity but only recorded in Lincolnshire once or twice a year.

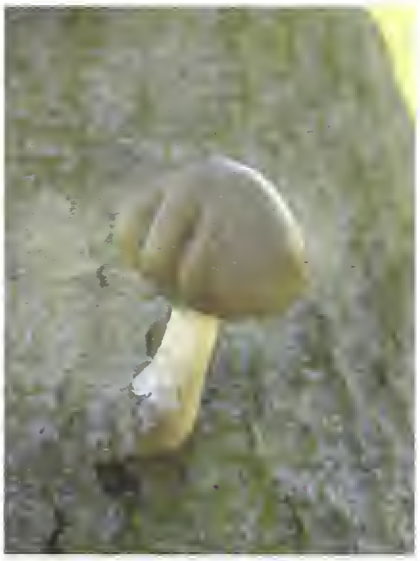
The annual foray at Chamber's Farm Wood organised by the Forestry Commission was well attended but not by the massive crowds of 'food for free' fungi hunters of previous years, perhaps the message is getting through. When I was asked to lead this foray I did emphasise to the organiser that I do not encourage the harvesting of wild fungi for the plate as this can be dangerous not only to the gatherer, but also to the long-term survival of our mycota. Of the eighty species recorded, of note were *Hydnum repandum*, the hedgehog fungus and *Macrotyphula juncea* that seem to be having a good year this year.

This year the LNU held its annual foray at Rigsby Wood near Alford with sixteen members attending. Sixty-eight species of fungi were recorded on the day and amongst these there were several interesting records. *Mycena citrinomarginata* had never been recorded in Lincolnshire before but not only was it found at Rigsby but it had also turned up the previous day at Chamber's Farm Wood, unmistakeable in the field with the use of a hand lens to see the yellow edges to

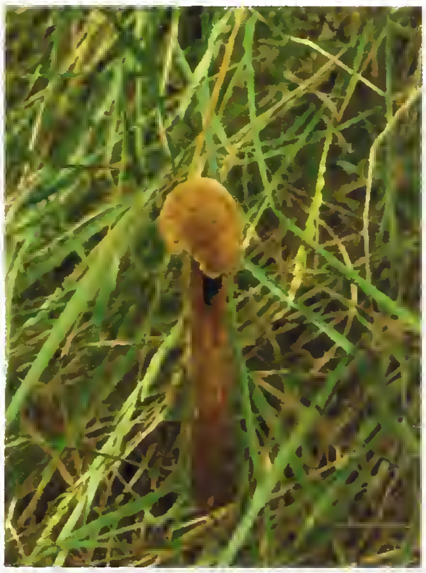


Helvella queletii. (p.107)

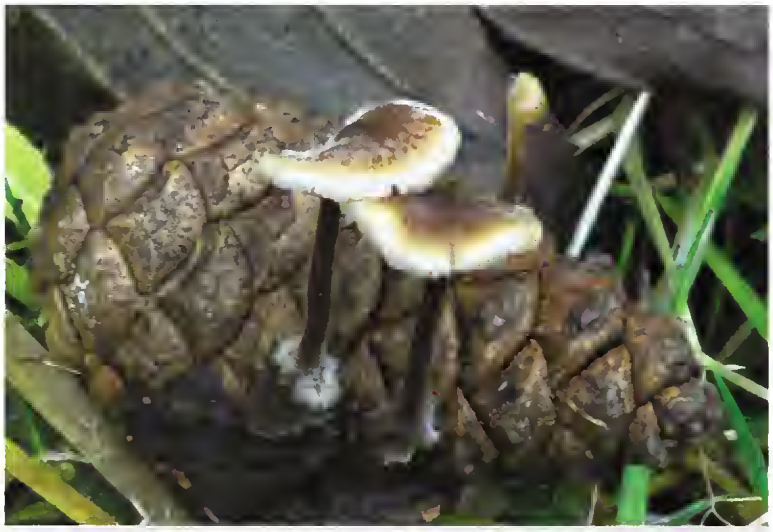
Picture Ray Halstead



Bolbitius reticulatus (p.109)
Picture Ray Halstead



Battarrea phalloides (p.107)
Picture Ray Halstead



Auriscalpium vulgare (p.109)

Picture Les Binns

the gills. *Lactarius subumbonatus* and *Psathyrella potteri*, (prona forma cana), again neither previously recorded in Lincolnshire. My favourite finds of the day had to be *Mycena haematopus*, which oozes red juice when broken, and *Auriscalpium vulgare* (see page 108) for its elusiveness and beauty.

Recent woodland management at Rigsby Wood has seen most of the Sycamores, *Acer pseudaoplatanus*, felled in an effort to eradicate this 'weed' tree from the otherwise native woodland. Thankfully the sawn timber has not been removed from the woodland but instead has been stacked in cube form and allowed to decay naturally, this has created a mini environment that favours fungi along with mosses and insects and provides suitable nest sites for a number of woodland birds.

My final public foray was at Whisby Nature Park at the end of October where we were joined by the Grantham Area Watch Group. Rather disappointingly many of the species that we would expect to find here were not fruiting this year and though we did amass a total of seventy species there were no finds of particular significance.

Willow Tree Fen is a new LWT reserve in the far south of the county between Bourne and Spalding lying adjacent to the River Glen. A former arable farm it has been developed as fen grassland and pasture with a small area of relatively young mixed woodland. I visited in the middle of October and was not disappointed to find very few fungi, a total of seventeen species, over a variety of habitats. The most notable of these was a splendid specimen of *Fistulina hepatica*, the beefsteak fungus, on the oak log pile near the visitor centre. It is my intention to return for a repeat of this exercise to see how the mycota increases as the reserve develops.

My local woodland, Willingham Woods and Eleanor & Lynwode Woods, produced a large amount of fungi in very small areas, with the former providing us with eighty species in less than two acres and the latter with forty in about the same area. Of significance in both cases was the species diversity and quantity of fruit bodies found. Due to the wet conditions experienced this year it was surprising to find so many.

This year I had decided to concentrate my efforts on one particular area and after listening to James Forrester waxing lyrical about the merits of Snipe Dales I cancelled my original venue and opted for Snipe Dales Country Park and Nature Reserve instead. I was there for three forays and amassed a total of over one hundred species over a wide range of habitats from Willow Carr and broadleaf woodland to grazed grassland and wet pasture.

The wet pasture had some felled mature beech trees, *Fagus sylvatica*, that produced amongst others, the expected *Meripilus giganteus* and *Xylaria polymorpha* but also *Oudimansiella mucida* and *Bolbitius reticulatus* (see page 109).

Mycena pura and *M. rosea* are two species that have recently been determined to be one and the same species. Having found both of them at Snipe Dales in broad-leaf woodland in association with beech, *Fagus sylvatica*, I would tend to disagree with this. They are easily distinguished one from the other especially when occurring in close proximity to each other but then, who am I to question the experts?

The Alder Carr area was extremely wet during my visit but a search for *Naucoria* species produced *N.escharoides* and *N.striatula* but nothing else fungal. Obviously *Naucoria* species are able to tolerate these conditions and have to due to their association with alder, *Alnus*.

An extensive search of the grazed grassland areas of the Nature Reserve produced three species of waxcaps, *Hygrocybe insipida, H.virginea* and *H.chlorophana*. Snipe Dales Country Park and Nature Reserve will be the venue for the LNU Annual Foray on National Fungus Day, 13th October 2013.

Fifty-four species were recorded from around Middle Rasen whilst out walking my dog and from my garden though the garden has produced very little this year as opposed to previous years.

My thanks to all those who to send me records and queries throughout the year. Please continue to do so, every record is important however common or insignificant it may seem. My special thanks to Les Binns for the excellent images, to Jackie Freeman for her help on forays and to Ken Rowland for his invaluable help in identifying the more difficult specimens.

MOSSES, LIVERWORTS AND LICHENS

M. R. D. Seaward

This has been a disappointing year, both bryologically and lichenologically, in that three key Lincolnshire workers have been unable to give their normal attention to site visits, in part due to the poor weather. Nevertheless, bryophytes and lichens flourish under the various weather regimes and, despite the loss of numerous key habitats over the past two centuries, many species have survived or are indeed on the increase. However, although many of the epiphytic assemblages seen today had been absent from county for 130 years or more, many of our heathland and mire species which survived until 50 years ago have seriously declined or indeed disappeared, the increased rainfall, particularly in 2012, not coming to the rescue of our once glorious wetland flora. However, there is no room for complacency since the undoubted loss of our ash trees, a major feature of the Lincolnshire landscape, will have a profound effect on woodland, parkland and roadside ecology, including of course the regenerated epiphytic bryophyte and lichen assemblages referred to above.

Additional bryological and lichenological work on churchyards has furnished further interesting records, and in the case of the British Lichen Society's churchyard survey, 11 more churches were visited for the first time (and a few others revisited) by the author in 2012. To date, 606 (representing almost 90% of the C. of E. churchyards in the county) have been lichenologically surveyed. However, as reported last year, there are problems regarding the conservation of both the cultural and the natural heritage they support. These once sacrosanct sites, which provide a most valuable oasis for wildlife, are not only subjected to vandalism, but also to insensitive management, such as excessive repointing of church walls and undue cleaning and re-erection of gravestones, which has often led to the demise of a formerly aesthetically pleasing mosaic of lichens. The status of particular lichen species and assemblages is currently being monitored by the author in numerous churchyards throughout the county.

Bryological work in the county has fortunately been supplemented by the visits of two leading bryologists, Dr M.O.Hill and Mr C.R.Stevenson in April 2012, and the latter again in October 2012, to whom we are grateful for their detailed records. Overall, records have been contributed in 2012 by J.Fraser (JF), R.Harding (RH), M.O.Hill (MOH), F.R.Lammiman (FRL), C.Rieser (CR), M.R.D.Seaward (MRDS) and C.R.Stevenson (CRS). As a consequence of their work, a county (*Hennediella macrophylla*), two vice-county (*Aspicilia calcarea* spp. *hoffmanniana* & *Hennediella macrophylla*), 68 divisional and numerous grid square records have been added to our registers. The bryophyte and lichen nomenclature below is according to Hill *et al.* (2008) and Smith *et al.* (2009) respectively.

Mosses

Barbula convoluta var. *sardoa* Schimp. + 17 (MOH & CRS)
Brachythecium mildeanum (Schimp.) Schimp. + 17 (MOH & CRC), 18 (MOH & CRS)
Bryum moravicum Podp. + 17 (MOH & CRS)
B. radiculosum Brid. + 18 (CRS)
B. ruderale Crundw. & Nyholm + 18 (MOH & CRS)
Cratoneuron filicinum (Hedw.) Roth. + 18 (CRS)
Cryphaea heteromalla (Hedw.) D.Mohr + 17 (MOH & CRS), 18 (CRS)
Didymodon insulanus (De Not.) M.O.Hill + 17 (MOH & CRS)
D. luridus Hornsch. ex Spreng. + 12 (RH)
D. rigidulus Hedw. + 18 (CRS)
D. sinuosus (Mitt.) Delogne + 17 (MOH & CRS)
D. tophaceus (Brid.) Lisa + 17 (MOH & CRS)
D. vinealis (Brid.) R.H.Zander + 12 (RH)
Fissidens gracilifolius Brugg.-Nan. & Nyholm + 17 (MOH & CRS)
Hennediella heimii (Hedw.) R.H.Zander + 17 (MOH & CRS)
H. macrophylla (R.Br.bis) Paris + 12 (SE of Leverton Lucasgate, 2012, RH, **VCR**), 17 (nr Washdyke Farm, 2012, MOH & CRS, **NCR**)
Hygroamblystegium varium (Hedw.) Mönk. + 18 (MOH & CRS)
Leucodon sciuroides (Hedw.) Schaegr. + 17 (MOH & CRS)
Microbryum davallianum (SM.) R.H.Zander + 18 (CRS)
Orthotrichum affine Brid. + 17 (MOH & CRS)
O. cupulatum Brid. + 12 (RH), 17 (MOH & CRS), + 18 (CRS)
O. pulchellum Brunt. + 17 (MOH & CRS)
Pseudocrossidium hornschuchianum (Schultz) R.H.Zander + 12 (RH), 18 (MOH & CRS)

Rhynchostegiella tenella (Dicks.) Limpr. + 17 (MOH & CRS)
Schistidium crassipilum H.H.Blom + 12 (RH), 17 (MOH & CRS), 18 (CRS)
Syntrichia virescens (De Not.) Ochyra + 17 (MOH & CRS), 18 (RH)
Tortula protobryoides R.H.Zander + 17 (MOH & CRS)
Ulota bruchii Hornsch. ex Brid. + 17 (MOH & CRS)
U. phyllantha Brid. + 17 (MOH & CRS)
Zygodon viridissimus (Dicks.) Brid. + 17 (MOH & CRS)

Liverworts
Lunularia cruciata (L.) Dumort. ex Lindb. + 12 (RH)
Marchantia polymorpha subsp. *ruderalis* Bischl. & Boisselier + 17 (MOH & CRS)
Metzgeria violacea (Ach.) Dumort. + 4 (FRL & CR), 17 (MOH & CRS)
Pellia endiviifolia (Dicks.) Dumort. + 17 (MOH & CRS), 18 (MOH & CRS)
Riccia glauca L. + 17 (MOH & CRS)
Ricciocarpos natans (L.) Corda + 16 (JF)

Lichens
Arthonia radiata (Pers.) Ach. + 10 (MRDS)
Aspicilia contorta subsp. *hoffmanniana* S. Ekman & Fröberg + 7 (on disused railway platform, Southrey, March 2012, MRDS, **VCR**)
Caloplaca crenulatella (Nyl.) H.Olivier + 1 (MRDS)
Cladonia gracilis (L.) Willd. + 10 (MRDS) – known only from four Lincolnshire sites
Collema tenax var. *ceranoides* (Borrer) Degel. + 1 (MRDS), 10 (MRDS)
Evernia prunastri (L.) Ach. + 17 (MRDS)
Flavoparmelia soredians (Nyl.) Hale + 7 (MRDS)
Haematomma ochroleucum (Neck.) J. R.Laundon var. *ochroleucum* + 17 (MRDS)
Hyperphyscia adglutinata (Flörke) H.Mayrhofer & Poelt + 7 (MRDS)
Hypogymnia tubulosa (Schaer.) Hav. + 2 (MRDS)
Lecanora hagenii (Ach.) Ach. + 7 (MRDS)
L. persimilis (Th.Fr.) Nyl. + 2 (MRDS)
L. rupicola (L.) Zahlbr. + 10 (MRDS)
Lecidella elaeochroma (Ach.) M.Choisy + 17 (MRDS)
Physcia stellaris (L.) Nyl. + 2 (MRDS)
Punctelia jeckeri (Roum.) Kalb. + 17 (MRDS)
P. subrudecta Nyl. s.str. + 2 (MRDS)
Pyrrhospora quernea (Dicks.) Körb. + 10 (MRDS)
Ramalina farinacea (L.) Ach. + 17 (MRDS)
R. fastigiata (Pers.) Ach. + 7 (MRDS)

References:

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BOTANY IN 2012

Paul Kirby

Eight field meetings were held in 2012:

April 29	Little Haw Wood, SK91
May 27	Oxgangs House Springs and adjacent arable, Nettleton Top, TF19
June 17	Bridge Farm, Snitterby Carr, TF09
July 1	Farmland at Baston Fen, TF11
July 15	Private Blow Well site at Holton Grange, TA20
August 19	Elsea Park Meadows and Elsea & Math Wood, TF01
September 8	Mayflower Wood, Immingham, TA11
October 21	Fungus Foray. Rigsby Wood, TF47

Among the plants found at the meetings were: marsh ragwort *Senecio aquaticus* in Little Haw Wood; wild thyme *Thymus polytrichus*, knotted hedge-parsley *Torilis nodosa*, crested hair-grass *Koeleria macrantha* and meadow oat-grass *Avenula pratensis* at Oxgangs House Springs, plus prickly poppy *Papaver argemone* and corn spurrey *Spergula arvensis* in adjacent arable; southern marsh-orchid *Dactylorhiza praetermissa* and a yellow flowered form of common vetch *Vicia sativa* subsp. *segetalis* at Snitterby; small toadflax *Chaenorhinum minus*, maple-leaved goosefoot *Chenopodium hybridum*, flixweed *Descurainia sophia*, dwarf spurge *Euphorbia exigua*, sharp-leaved fluellen *Kickxia elatine*, Venus's-looking-glass *Legousia hybrida*, night-flowering catchfly *Silene noctiflora* and grey field-speedwell *Veronica polita* at Baston; great brome *Anisantha diandra* and least duckweed *Lemna minuta* at Holton le Clay ; narrow-leaved water-plantain *Alisma anceolatum*, grey sedge *Carex divulsa* subsp. *divulsa* and orange foxtail *Alopecurus aequalis* in Elsea Park Meadows and thin-spiked wood-sedge *Carex strigosa* and wild service-tree *Sorbus torminalis* in Elsea & Math Woods.

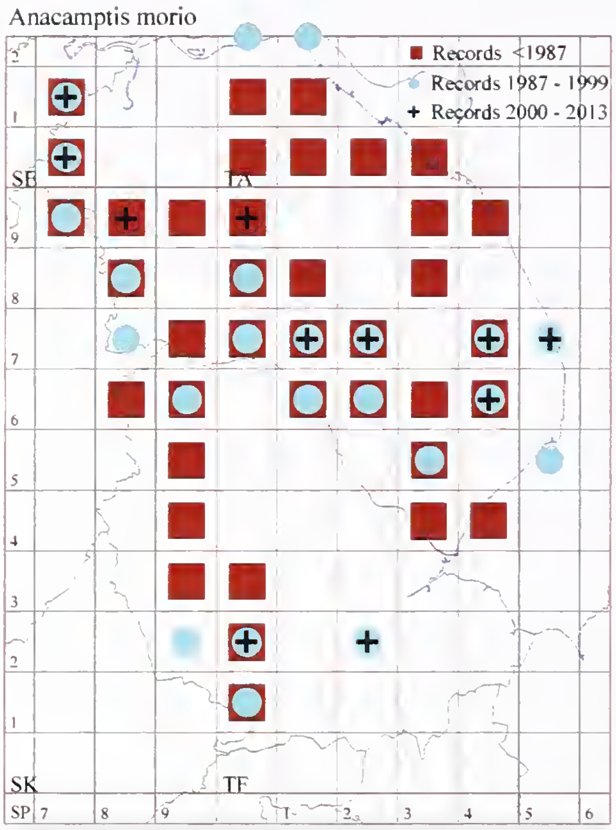
Botanical Society of the British Isles

A BSBI field meeting was held at Grimsthorpe Park, TF02 on 23 June, 2012. Plants recorded in the limestone grassland included purple milk-vetch *Astragalus danicus* and plentiful early gentian *Gentianella anglica.* Night-flowering catchfly *Silene noctiflora* was found on a wood edge and henbane *Hyoscyamus niger* in rabbit-disturbed ground [SL].

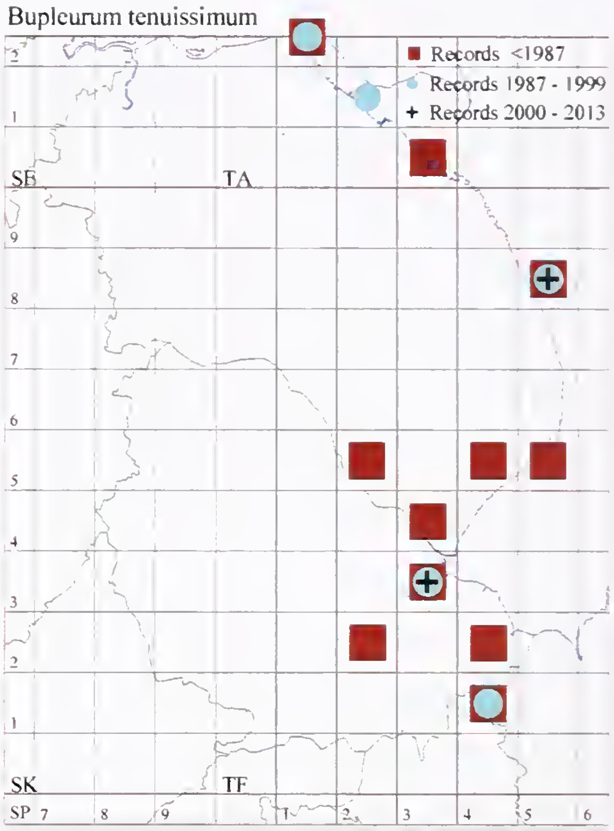
BSBI Threatened Plant surveys

The species covered in 2012 included green-winged orchid *Anacamptis morio*, slender hare's-ear *Bupleurum tenuissimum*, corn buttercup *Ranunculus arvensis* and Smooth Cat's-ear *Hypochaeris glabra*. The distributions of the hectad records for these four taxa are summarised on date banded maps 1 – 4 (see page 114).

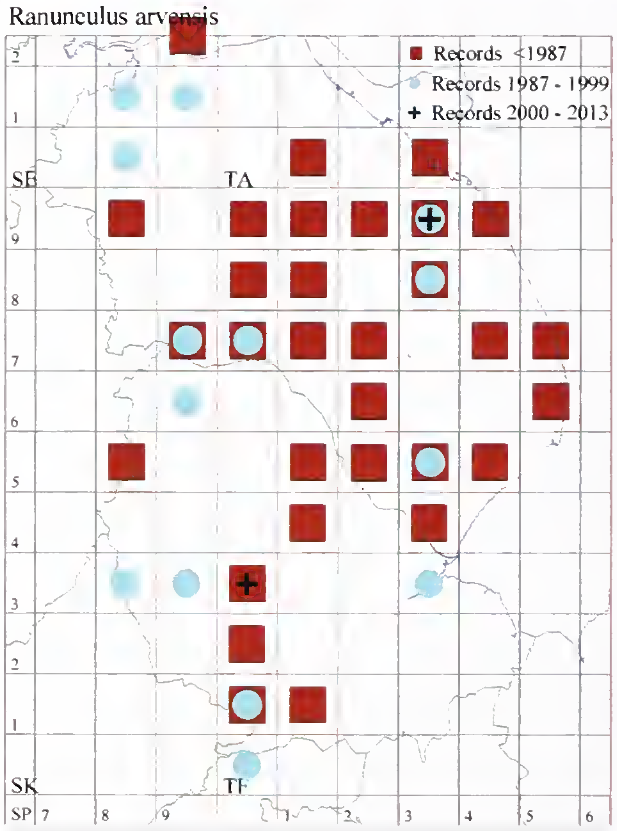
Green-winged orchid, (see page 116), has been recorded at 13 sites [11 hectads] since 2000. Large populations are present in three LWT Reserves, but numbers at most of the other colonies are very small.



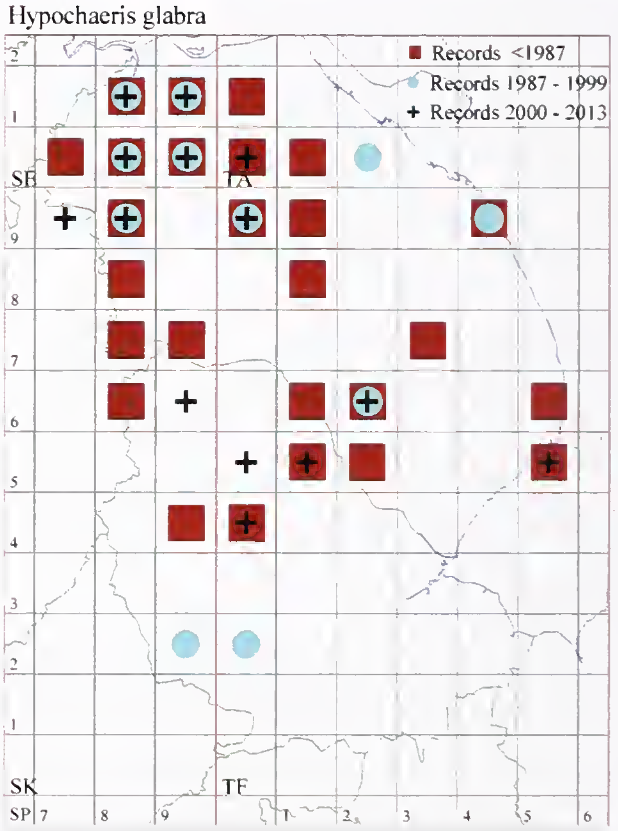
Map 1: Date banded distribution of hectad records. *Anacamptis morio* (p.113)



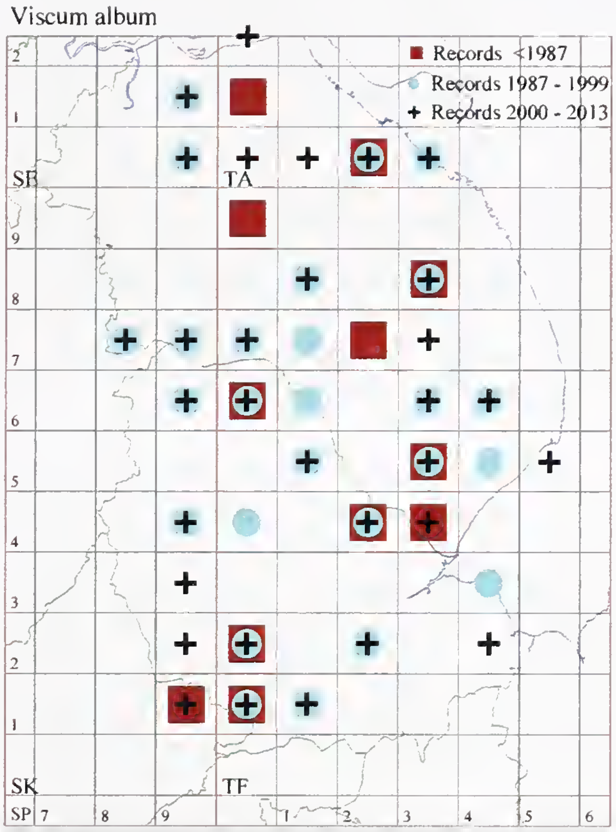
Map 2: Date banded distribution of hectad records. *Bupleurum tenuissimum* (p.113)



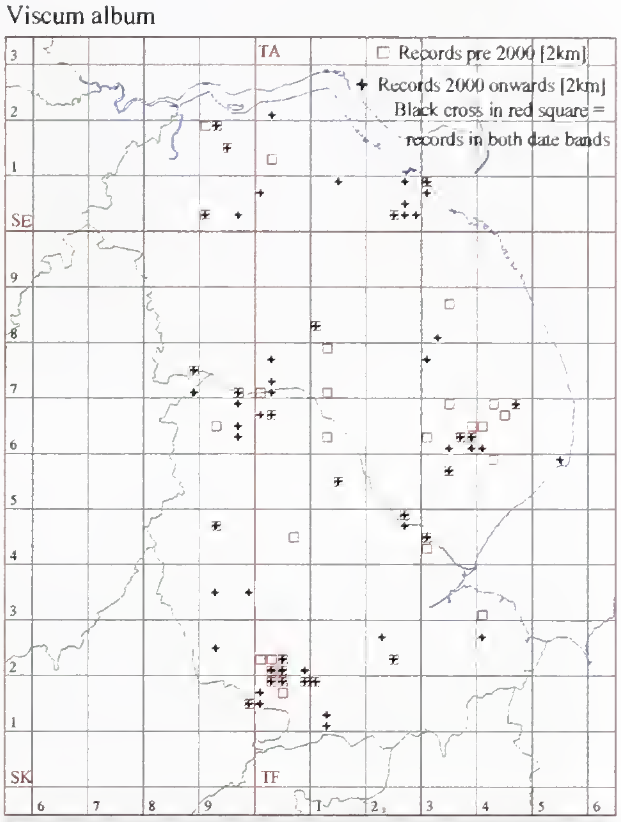
Map 3: Date banded distribution of hectad records. *Ranunculus arvensis* (p.113)



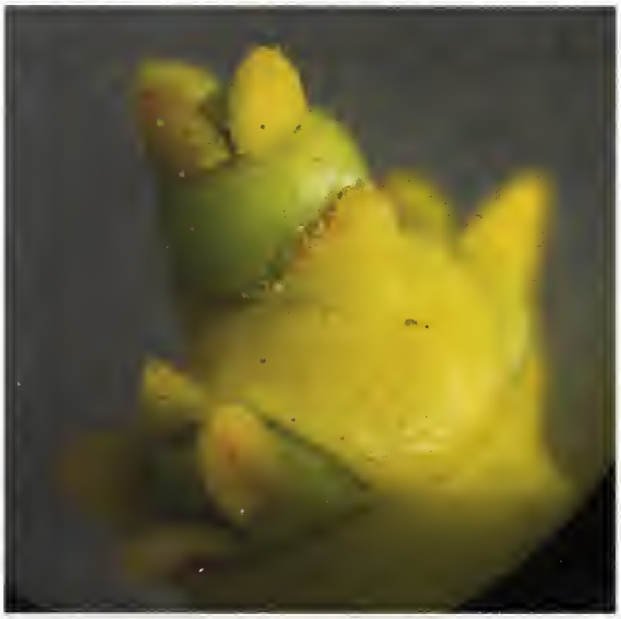
Map 4: Date banded distribution of hectad records. *Hypochoeris glabra* (p.113)



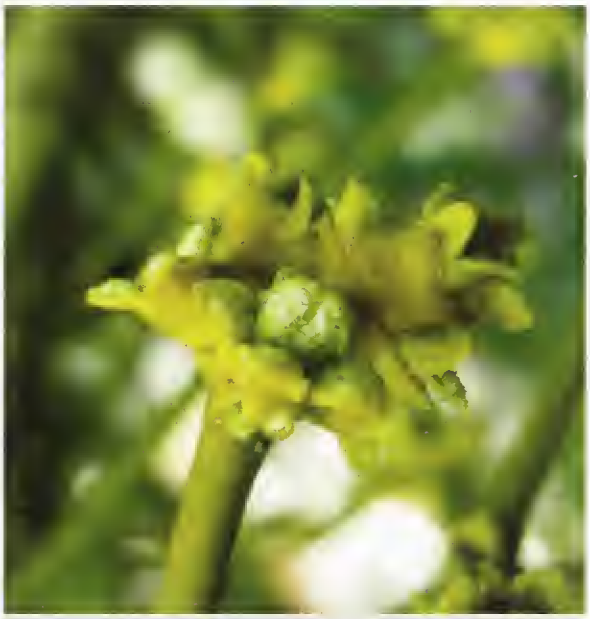
Map 5: Date banded distribution of hectad records. *Viscum album* (p.118)


Viscum album
Records pre 2000 [2km]
Records 2000 onwards [2km]
Black cross in red square = records in both date bands
TA
SE
SK
TF

Map 6: Date banded distribution of 2 km sq. records. *Viscum album* (p.118)



Viscum album female flower (p.116)
Picture Colin Hutchinson



Viscum album male flower (p.116)
Picture Colin Hutchinson

Slender hare's-ear, a slender annual of open coastal vegetation, has been recorded in only 2 hectads since 2000. In 2012 only 10 plants could be found on the sea bank site at Trusthorpe, TF58 but 100's of plants were present on the banks of the Witham Outfall in TF33. On the North side, where most of the plants are confined to a narrow band, c.1 metre wide, just above the foot of the front slope of the flood bank, the population is scattered along at least 1.5 Km.

Corn buttercup, an autumn germinating annual of cereal fields, was once widespread in the county but is now extremely rare. Recorded all time from at least 39 hectads it has undergone a dramatic decline and is currently known from only one hectad in Vc54. Here it occurs in the margins of two arable fields in TF39, which are managed to promote its survival. A possible second population, yet to be confirmed, has recently been found in TF03 in Vc53.

Smooth cat's-ear is a small autumn germinating annual of open vegetation on light usually sandy soils. It can be easily overlooked especially on dull days or in the afternoon when the distinctive flowers tend to close. Although Nationally scarce, it has been recorded from 14 hectads since 2000 in Lincolnshire, and does not qualify as a scarce plant in the County. A surprise discovery by JF in 2012 was a very extensive population [estimated to include at least 10,000 flowers] on an old airfield site in TF26. Though more frequent in the north of the county, it has recently been noted on three verge sites in Vc53 [TF 04 & TF05]. These records are still to be confirmed.

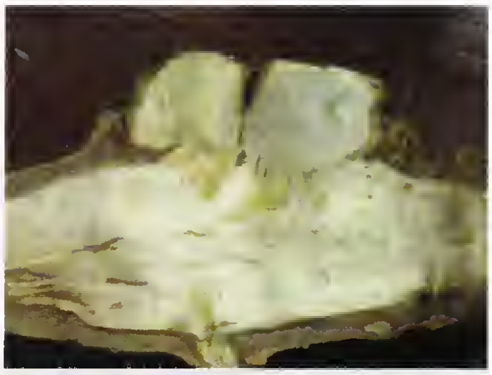
Review of Mistletoe *Viscum album* in Lincolnshire.

This was undertaken during the winter & spring of 2011/2012 and was greatly helped by information sent in to 'Wildnews Bulletin' in response to a request posted by Roger Parsons.

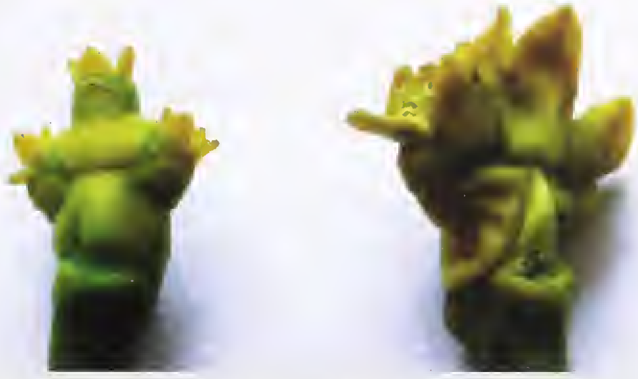
Mistletoe is dioecious, i.e. the male and female flowers are borne on separate plants (see page 115). Flowering occurs from February to April & the familiar berries appear in November/December. From a distance the male & female flowers look similar and in the absence of berries sexing a plant may prove difficult especially as, more often than not, the mistletoe is well out of reach, high up in the host tree.

Photograph 2 on page 117 shows female and male flowers side by side with leaves removed, female on left & male on right. Photograph 2 on page 115 shows a close-up of male flowers with their unusual sessile anthers opening by small pores and photograph 1 shows a close-up of female flowers.

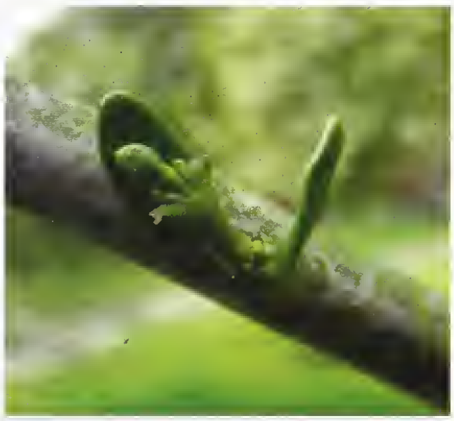
Host trees recorded include field maple *Acer campestre*, sycamore *A. pseudoplatanus*, ornamental maple *Acer* sp. cultivars, horse-chestnut *Aesculus hippocastanum*, hawthorns *Crataegus monogyna* & cultivars,apple *Malus pumila*, crab apple *M. sylvestris*, wild cherry *Prunus avium*, *Prunus* cultivars, pear *Pyrus* agg., hybrid poplar *Populus x canadensis*, false-acacia *Robinia pseudoacacia*, weeping willow *Salix* sp., lilac *Syringa vulgaris* and hybrid lime *Tilia* x *europaea*. Mistletoe will also apparently grow on itself, (see photograph 5 on page 117).



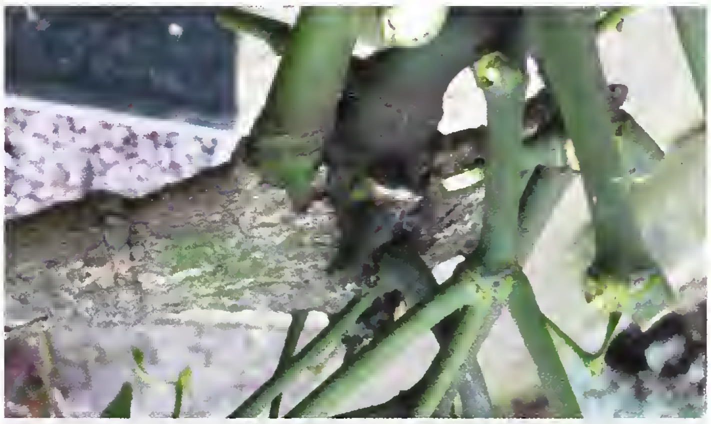
Viscum album attachment longitudinal section (p.118)
Picture Paul Kirby



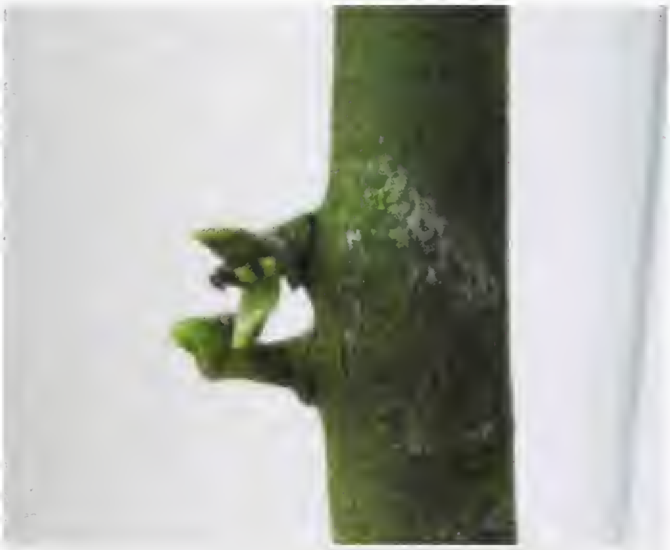
Viscum album female and male flower (p.116)
Picture Colin Hutchinson



Viscum album seedling (p.116)
Picture Colin Hutchinson



Viscum album attachment to poplar (p.118)
Picture Paul Kirby



Viscum album apparent self-parasitism? (p.116)
Picture Colin Hutchinson

Green-winged Orchid (p.113)
Picture Jayne Eames

Photograph 3 on page 117 shows a young mistletoe plant. Branching is dichotomous and each branch produces one pair of new internodes per year. Thus by counting the number of forks along a single branch it is possible to age an individual plant. Photograph 4 on page 117 shows the attachment of a mature plant to a poplar branch and photograph 1 shows a longitudinal section through this junction.

The distribution of the mistletoe records is summarised on date-banded maps. Map 5 is hectad based and Map 6 tetrad based (see page 115).

The hectad map shows the plant to be widespread and recorded from 39 hectads all time: 12 pre-1987, 26 between 1987 - 1999 and 31 since 2000. The tetrad map shows the plant to be sparsely scattered, but with hotspots around Grimsthorpe TF01/02, Stickney/Stickford TF36/46, Lincoln SK96 & TF06/07 and the Waltham/Scartho/Cleethorpes area TA20/30. There are 1923 tetrads wholly or partly in Lincolnshire. Mistletoe has been recorded from 81 all time, i.e. approximately. 4.2% of the total.

The tetrad map almost certainly understates the distribution of the plant which is very likely present in back-gardens and old orchards well hidden from view. It is likely that mistletoe will become more widespread as it is now possible to buy young trees already sporting mistletoe from specialist nurseries.

A sample of the records received for 2012 (Some non-native taxa are included).

Narrow-leaved water-plantain *Alisma lanceolatum*, roadside ditch at Boston Long Hedges, TF34, PK & CH and Elsea Park Meadows, TF01, Brian Hedley, Neil Harris & Richard O'Connor.

Orange foxtail *Alopecurus aequalis*, Burgh le Marsh, TF56, JF and Elsea Park Meadows, TF01, Brian Hedley, Neil Harris & Richard O'Connor. Two new sites for a grass scarce in the county.

Stinking chamomile *Anthemis cotula*, a patch of about 20m x 20m in an arable field corner between Holywell & Little Bytham, TF01, SL.

Lesser water-plantain *Baldellia ranunculoides*, Dyke Fen, Bourne, TF12, JG.

Nodding bur-marigold *Bidens cernua*, a total of 40 plants at 3 locations in Whisby Nature Reserve, SK96, Richard Davidson. A re-find, last seen here in 1998. This is now an extreme rarity in the county and Whisby may well be its only remaining site.

Moonwort *Botrychium lunaria*, Sotby Meadows, TF27, Jenna Poole & JF. A re-find. Last seen here in 2003 when 3 fronds were noted. 2 patches with a total of 34 fronds were found in 2012. At present only known from one other site in the county.

Large bitter-cress *Cardamine amara*, a thriving population at Lower Sowdale, TF36, JF & Catherine Collop. A re-find. Last recorded here in 2001.

Grey sedge *Carex divulsa* subsp. *divulsa*, Elsea Park Meadows, TF01, Brian Hedley, Neil Harris & Richard O'Connor. A new location for this sedge which is scarce in the county.

Lincolnshire spinach or markery, *Chenopodium bonus-henricus*, Whisby Nature Reserve, SK96, Richard Davidson.

Basil thyme *Clinopodium acinos*, Kirton in Lindsey quarry, SE90, Stuart Smith & Angela Buckle.

Bilbao fleabane *Conyza floribunda*, casual at Whisby Nature Reserve, SK96, Phil Porter & Richard Davidson. A new record for Lincolnshire.

Cut-leaved teasel *Dipsacus laciniatus*, about 15 plants on the margin of the car park at Frampton Marsh, TF33, SL. A new record for Lincolnshire.

Dwarf spurge *Euphorbia exigua*, Thurlby Fen, TF11, JG, also Barton Cliff, arable margin, TA02, Stuart Smith & Angela Buckle.

Opposite-leaved pondweed *Groenlandia densa*, Thurlby Fen, TF11, JG.

Bitter-vetch *Lathyrus linifolius* var. *montanus* in a meadow near Lea, SK87, JF & PK. A new site.

Venus's-looking-glass *Legousia hybrida*, Barton Cliff, arable edge, TA02, Stuart Smith & Angela Buckle.

Blinks *Montia fontana* subsp. *chondrosperma*, West Ashby roadside, TF27, Bill Meek, a ride in Newball Wood, TF07, PK & CH and Lower Sow Dale, TF36, JF. This is the only one of the four subspecies that has been recorded in Lincolnshire to date.

Catmint *Nepeta cataria*, Middle Rasen Plantation TF19, David Harrison.

Tubular water-dropwort *Oenanthe fistulosa*, River Welland and two sites on the Counter Drain, all TF21, JF and a single plant in the River Glen, TF12, JG.

Knapweed broomrape *Orobanche elatior*, Kirton in Lindsey, SE90, Stuart Smith & Angela Buckle

Curved hard-grass *Parapholis incurva*, Skegness, TF56, PK. A nationally scarce coastal grass.

Flat-stalked pondweed *Potamogeton friesii*, River Glen in both TF12 & TF22, JG and River Welland, TF21 & South Drove Drain, TF22, JF.

Shepherd's-needle *Scandix pecten-veneris*, a very large population of this Nationally Scarce species in an arable field between Holywell and Little Bytham, TF01, SL.

Black bog-rush *Schoenus nigricans*, Scotton Common Road Verge, SK89, JF.

A second site in SK89 for this County rarity. A re-find. Last recorded from this verge in 1980.

Night-flowering catchfly *Silene noctiflora*, about 20 plants on an arable field margin at Little Bytham, TF01, SL.

Sea campion *Silene uniflora*, back of sea bank in Acre Gap, between Sutton on Sea & Sandilands, TF58, PK. Currently only known from only 2 sites in the county.

Small cord-grass *Spartina maritima*, Wrangle Saltmarsh, TF45, Tim Smith. A second location for this nationally scarce grass on the Lincolnshire coast and the most northerly native site in Great Britain.

Corn spurrey *Spergula arvensis*, thousands of plants on an arable site previously sown with pheasant cover seed mixes, near Burgh on Bain, TF28, PK & CH.

Marsh fern *Thelypteris palustris*, dune slack at Gibraltar Point, TF55, Craig and Grenville Levy. A new site for this Nationally scarce fern. Currently known from only two sites in the county.

Bird's-foot clover *Trifolium ornithopodioides*, 2 plants at Tattershall Pits, TF25, Keith & Wendy Robertson. Only the third record for the county. Previously recorded at Gainsborough in 1850 & Fulbeck in 1897.

Hybrid mullein *Verbascum* x *semialbum* [*V. thapsus* x *V. nigrum*], 1 plant growing with *V. nigrum* in Horncastle, TF26, Keith & Wendy Robertson. New record for Lincolnshire.

Hybrid water-speedwell *Veronica* x *lackschewitzii* [*V. anagallis-aquatica* x *V. catenata*], Kirkby on Bain Gravel Pits, TF26, Keith & Wendy Robertson. First record for Vc54, North Lincs. Most likely under-recorded.

Stoneworts: Charophyte records included *Chara aspera* in a roadside ditch in Dyke Fen, Bourne, TF12, JG and *Nitella flexilis* sens. lat., New River, TF21, JF.

Many thanks to all who sent in records in 2012.

Special thanks to Mr Wheeldon of Waddington for providing much information on mistletoe and also for allowing his mistletoe to be photographed.

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Key to initials in text
JF, Jeremy Fraser – JG, Jonathan Graham - CH, Colin Hutchinson – PK, Paul Kirby – SL, Sarah Lambert

FRESHWATER INVERTEBRATES IN 2012

Richard Chadd

2012 provided little of note. The most significant development was the discovery of an extensive population of the invasive Ponto-Caspian gammarid shrimp *Dikerogammarus haemobaphes* (Eichwald) in the Fossdyke Canal and Lower Witham, in survey work undertaken by Holly Longstaff and Jake Reeds of the Environment Agency. To date, the species has invaded as far as Washingborough (TF0157170982).

Closely related to *Dikerogammarus villosus* (the so-called Killer Shrimp, which is currently invading Grafham Water, parts of South Wales and the Norfolk Broads), the species has entered Lincolnshire from populations resident in the River Trent, by direct connection via the Fossdyke, probably facilitated by boat traffic.

Though not thought to be as destructive as *D. villosus*, the species is, nevertheless, a vigorous predator and appears to be able to colonise faster-flowing river reaches than *D. villosus*. It is already widespread throughout the UK as a result. Intensive biosecurity methods, including close checking of equipment used in riverine environments (such as fishing-tackle, waders, boats, engineering equipment, etc.), followed by cleaning and full drying, may prevent the species from invading stillwater sites without open connections to rivers, such as nature reserves. In such situations, the species has the potential to compromise the freshwater ecology, so vigilance is greatly encouraged. The Environment Agency (via the author) can be consulted for advice on this.

On a more positive note, larvae of the caseless caddisfly *Holocentropus dubius* (Rambur) were found in the River Welland upstream of Stamford in November 2012. Nationally, the species is regarded as quite common, but is decidedly local in Lincolnshire. The author has found the species at Snakeholme Pit near Bardney and Swanholme Lakes near Lincoln, but has only seven records at these two sites since 1990.

ODONATA IN 2012

Nick Tribe

The highlight of 2012 was the discovery on 1st July by John Walker and Edmund Mackrill of 4 red-veined darters *Sympetrum fonscolombei* (2 males, 2 females), on a wet grassland created under the Higher Level Scheme in 2007 at Croft Marsh (TF56). This is a new 10km record and it is tempting to suggest that it was colonised from the long-established population at Gibraltar Point NNR (TF55) which is thought to have been established in 1998. Edmund and Monica Mackrill re-surveyed the site on 5th July and saw 12 males.

Steve Routledge recorded variable damselfly *Coenagrion pulchellum* at Messingham Sand Quarry SSSI (SE93) on 13th May and no fewer than 33 brown hawkers *Aeshna grandis* at the same site on July 12th.

John Redshaw reported a very late male hairy dragonfly *Brachytron pratense* at Baston Fen on 16th August. Almost all flight records of this species are from May and June. No doubt this record was a result of a late emergence due to the poor early summer.

Sue and Chris Bottomer surveyed the Sea Bank Clay Pits SSSI and the new Coastal Country Park (all TF57) almost weekly throughout the recording season. They recorded no fewer than 14 species and noted red-eyed damselfly *Erythromma najas* and small red-eyed damselfly *E. viridulum* from this square for the first time.

Between the Lincolnshire Environmental Records Centre and records submitted to me, over 13,000 records have been submitted to British Dragonfly Society for the Dragonfly Atlas. All of Lincolnshire's 94 whole or part hectads have some post-2000 records and I am grateful to all those who helped out, particularly in some of the less-visited areas in the south of the county.

SHIELDBUGS IN 2012

Annette Binding

2012 was not a good year for invertebrates. Nevertheless, I received records of fifteen of the twenty species of shieldbugs with post year 2000 Lincolnshire records.

Six of the species recorded in 2012 had only a single record. Three of these were new site records. Bishop's mitre *Aelia acuminata* was recorded by Charlie Barnes at Little Haw Wood near Castle Bytham on 29th April, a new site and the first record for VC53. The species was new to the county in 2007 and is still expanding its range. The second species with a single record from a new site was the blue bug *Zicrona caerulea* which was found by Richard Davidson on the 28th March at Thurlby Gravel Pits. Thirdly Natalie and George Rutter sent in the only record of juniper shieldbug *Cyphostethus tristriatus*, a species which is rather uncommon in the county. They found it on the 17th February at Sloothby.

The other three species with only a single record included forget-me-not shield-bug *Sehirus luctuosus* recorded at Blankney Fen on the 6th August by Alan Lazenby and gorse shieldbug *Piezodorus lituratus* and parent bug *Elasmucha grisea* both recorded at Messingham Sand Quarry LWT Reserve by John Davison. The gorse shieldbug was found on the 24th April and the parent bug on the 13th May.

Dolycoris baccarum, new to the county in 2005, added a another new site to its expanding range when it was recorded at Laughton Forest on the 12th June by John Davison.

2012 seems to have been a good year for the hawthorn shieldbug *Acanthosoma haemorrhoidale* as I received more records of that than of any other species. Usually it is the common green shieldbug *Palomena prasina* with the most records.

My thanks to the people who sent me their records. Charlie Barnes, Richard Davidson, John Davison, Karen and Sarah Hand, Dave Hatton, Kay Heath, Brian Hedley, Alan Lazenby, Sam Marr, Sue Mason, Natalie and George Rutter and Robert Walker.

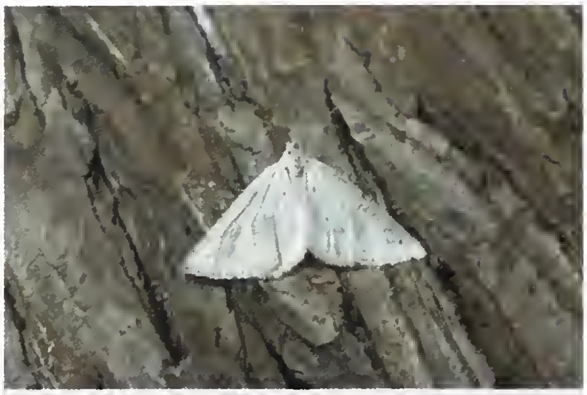
MOTHS IN 2012

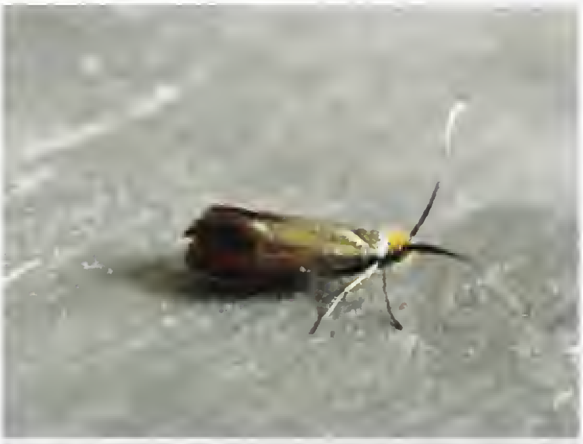
Martin Gray

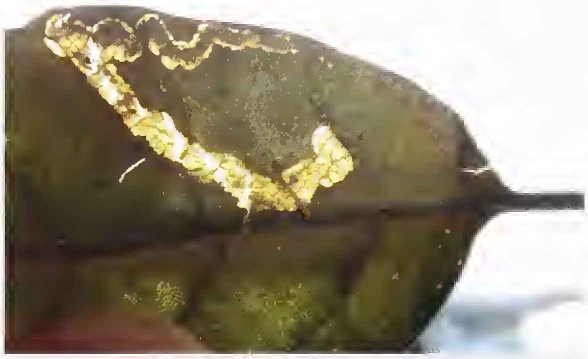
Being the second wettest year on record certainly had an effect on the mothing year and never really got going until August when the weather improved. However there were several new Lincolnshire records and a few unexpected occurrences.

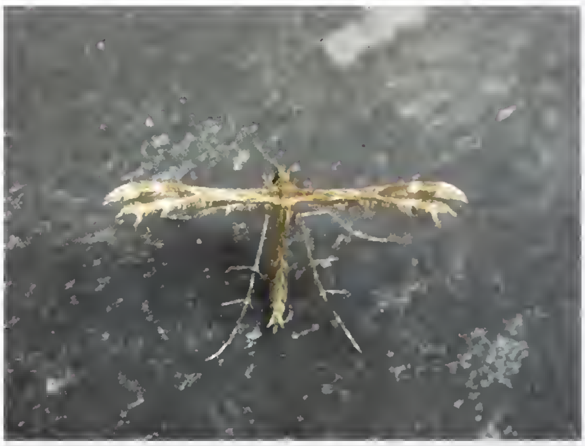
Tim Bagworth enticed a grey carpet *Lithostege griseata* (see page 124) on the 5 July 2012 at Gibraltar Point, a new Lincolnshire record, this was probably a wanderer from the Norfolk Brecks population. It is a plain but attractive species with the caterpillars feeding on flixweed *Sisymbrium sophia* and treacle mustard *Erysimum cheiranthoides*.

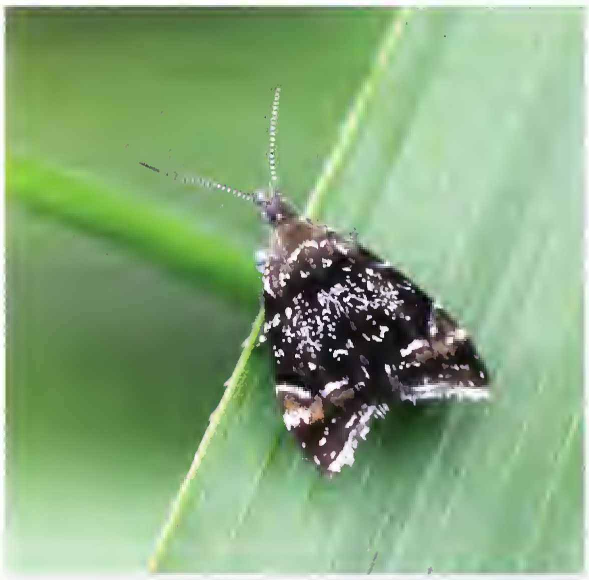
A small ranunculus *Hecatera dysodea* (see page 126) recorded by Colin Pumphrett appeared at Broughton on the 14 August 2013 , this was an expected record as the moth is showing a rapid northerly expansion through Britain. The last Lincolnshire record states 1918/19 but it looks dubious and needs scrutinising. The larva feed on prickly lettuce *Lactuca serriola* and I

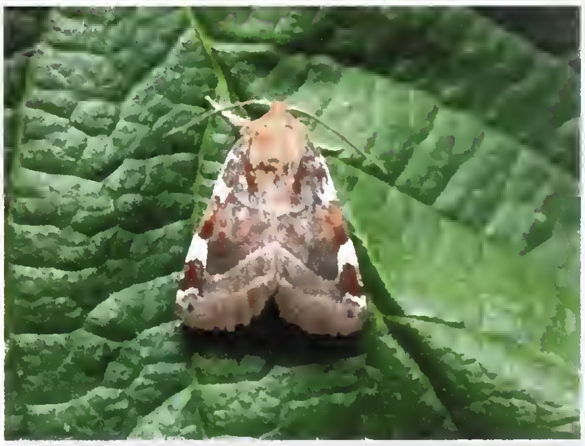

Grey carpet (p.123)
Picture Tim Bagworth


Nemophora cupriacella (p.125)
Picture Martin Gray


Mine of *Stigmella suberivora* (p.125)
Picture Martin Gray


Breckland plume (p.125)
Picture Martin Gray


Prochoreutis sehestediana (p.125)
Picture Rachel Scopes


White-spotted pinion (p.125)

Cydia amplana
Picture Nigel Lound

Small ranunculus (p.126)
Picture Colin Pumphrett

predict a few more records in the coming years.

Other notable macro species include white-spotted pinion *Cosmia diffinis* (see page124), a BAP Priority species which was trapped in Martin Gray's garden in Broadholme on the 18 August 2012. This species has declined drastically in the last couple of decades as the caterpillars feed on elm, a much less common tree following the onset of Dutch Elm Disease. They are now restricted to a few woodlands in the south-east of England but are showing some signs of expanding

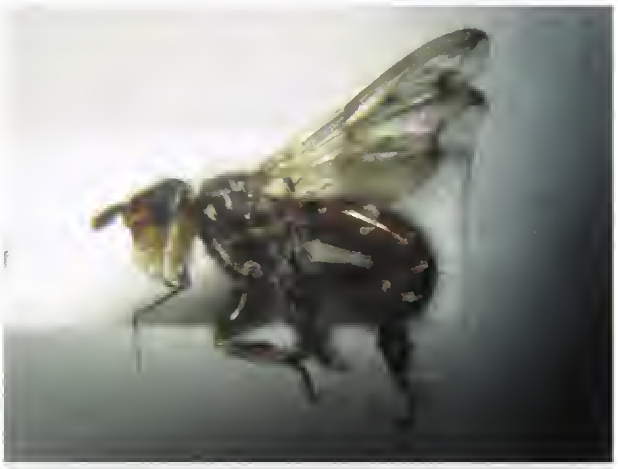
In his Skegness garden Nigel Lound trapped a *Cydia amplana* (see above) being a new Lincolnshire record on the 18 August 2012. It proved a good year for this migratory species as it appeared in many counties including some in-land records.

Whilst sweeping field scabious *Knautia arvensis* at Whisby Nature Reserve, Martin Gray recorded a Longhorn species *Nemophora cupriacella* (see page 124) which proved to be the first record for Lincolnshire. This is a nationally scarce species and flies during the day.

At Gibraltar Point a Breckland plume *Oxyptilus distans* (see page 124) was recorded by Tim Bagworth, a new Lincolnshire record. This species feeds on a variety of thistles and may well be resident as several were trapped subsequently. Over the border in Norfolk it is classed as common so it has a good chance of colonising the area.

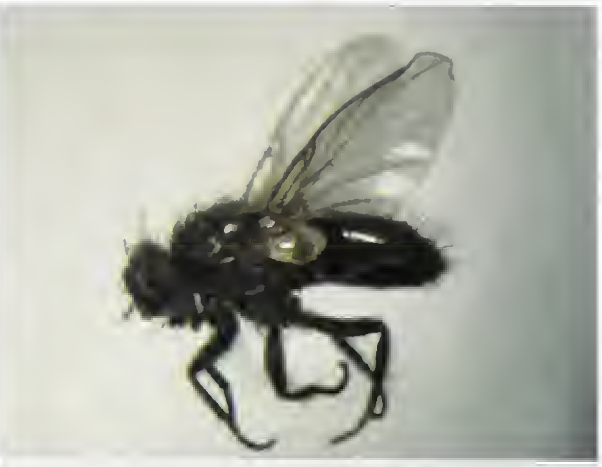
Rachel Scopes photographed a group of moths she noticed nectaring on ragwort *Jacabaea vulgaris* at Kirkby Moor on the 23 August 2012. After some investigation it was confirmed that they were *Prochoreutis sehestediana* (see page 124) again new to Lincolnshire. The caterpillars feed on skullcap *Scutellaria galericulata* which is seen on the reserve. The adults are quite pretty with silvery markings

First recorded in Britain in 1928 is the leaf miner *Stigmella suberivora* (see page 125) that mines the leaves of evergreen oak. Martin Gray found several mines



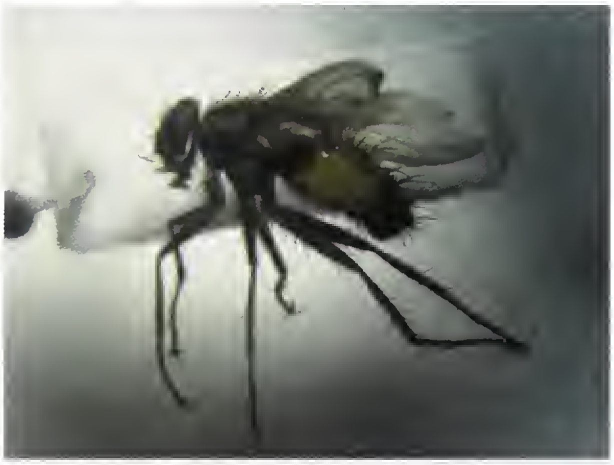
Myopa strandi (p.130)

Picture Phil Porter



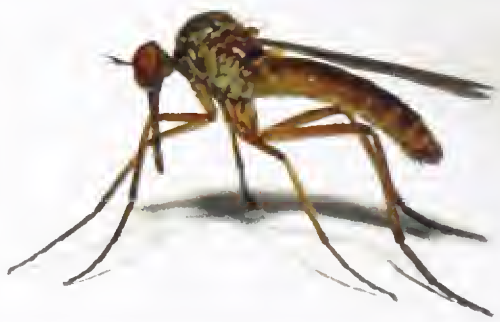
Phytomyptera nigrina (p.131)

Picture Phil Porter



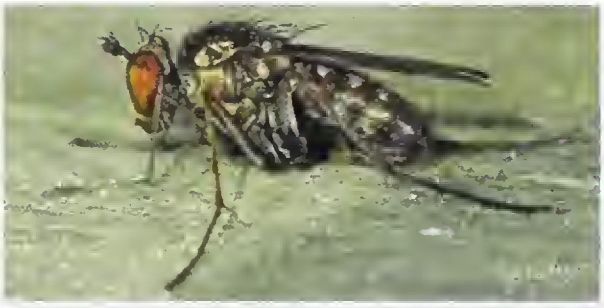
Thelaira solivaga (p.130)

Picture Phil Porter



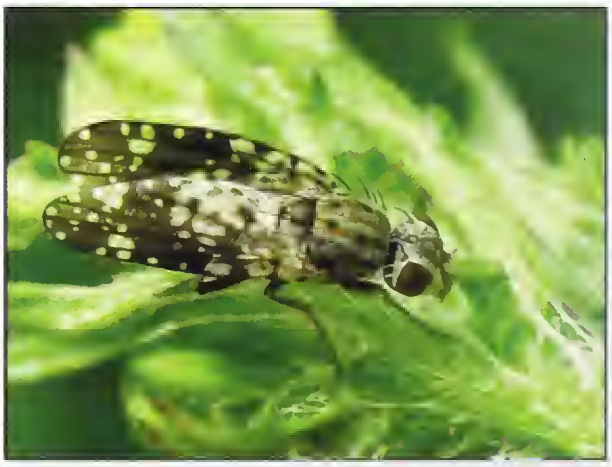
Empis scutellata (p.129)

Picture Wikipaedia



Tachytrechus insignis (p,130)

Picture Wikipaedia



Campiglossa misella (p.130)

Picture Wikipaedia

on holm oaks *Quercus ilex* along East Road in Sleaford on the 4 November 2012. This is one of a few species that are moving up from the south possibly due to global warming.

BUTTERFLIES IN 2012

Allan Binding

In 2012 the year began with drought conditions and then turned out to be the second wettest year on record. This had a devastating effect on butterfly numbers throughout the country.

Butterfly species which emerged in early spring faired quite well but those emerging in late spring and summer were well down in numbers.

Marsh fritillary *Eurodryas aurinia* were at their peak in May with 23 being seen on one day. Duke of Burgundy *Hamearis lucina* did quite well with approximately 200 ova being found in one location.

Small tortoiseshells *Aglais urticae* were down in numbers but peacocks *Inachis io* were surprisingly very common with about 400 being recorded in August. Most of the summer species of butterflies struggled to find enough days of good weather to fly and breed. Small copper *Lycaena phlaeas*, small heath *Caenonympha pamphilus,* gatekeeper *Pyronia tithonus*, meadow brown *Maniola jurtina* and ringlet *Aphantopus hyperantus* all had a poor year.

The skippers also had a poor year. Only the small skipper *Thymelicus sylvestris* reached fair numbers. Dingy skippers *Erynnis tages* peaked in numbers in May when 40 were recorded but only 20 grizzled skippers *Pyrgus malvae* were seen in the same month.

A few dark green fritillaries *Mesoacidalia aglaja* were seen in South Lincolnshire. The silver-washed fritillary *Argynnis paphia* was recorded in North and South Lincolnshire for the second time in two years. They were also reported from parts of East Anglia in 2012.

Very few migrant butterflies were recorded. Only a few clouded yellows *Colias crocea* and painted ladies *Cynthia cardui* were reported and there was a single Camberwell beauty *Nymphalis antiopa* seen in a Colsterworth garden.

I would like to thank all Lincolnshire Naturalists Union and Butterfly Conservation members who sent in their butterfly records in 2012.

DIPTERA IN 2011/12

Phil Porter

The Lincolnshire Naturalists' Union Diptera spreadsheet currently holds about 27,000 records dating back to 1885. A number of important datasets have still to be incorporated, so the statuses are based on present knowledge. Buglife's 'Stepping Stones' project of 2011 is outlined elsewhere in this issue. A very significant number of flies which currently appear to be new to Lincolnshire were recorded during that survey and are among those listed here.

Thanks are due to Charlie Barnes who sent specimens and several people who provide images during the year.

Abbreviations for 1st initials(=collector), and 2nd initials(=confirmer if different) in the records is as follows;

A.G. = Andrew Grayson (consultant to Buglife)
A.Go. = Andy Godfrey
A.I. = Tony Irwin (Norwich Museum)
A.J. = Andy Jukes
A.P. = Alan Phillips
A.S. = Alan Stubbs
C.R = Chris Raper (Tachinid Recording Scheme)
D.C. = David Clements (Conopid Recording Scheme)
E.G.= Eddie Gaunt
J.D. = John Deeming
J.Da. = John Davison
J.F. = Jeremy Fraser
J.R. = Jan Rousseau
P.P. = Phil Porter
R.C. = Roy Crossley
R.D. = Richard Davidson

Many thanks to all those concerned.

Diptera recorded new to Lincolnshire in 2011.
Bibionidae
Bibio ferruginatus , Messingham Sand Quarry, SE912039, 30/04/2011, A.G.
Bibio varipes , Messingham Sand Quarry, SE912039, 30/04/2011, A.G.

Cecidomyiidae
Contarinia artemisiae , Whisby NR, SK9166, 02/10/2011, J.R.
Macrodiplosis pustularis , Whisby NR, SK9166, 05/08/2011, J.R.
Macrodiplosis roboris , Whisby NR, SK9166, 23/09/2011, J.R.

Chloropidae
Oscinella cariciphila , Far Ings, TA015231, 09/09/2011, J.D.

Culicidae
Aedes annulipes , Messingham Sand Quarry, SE912039, 14/06/2011, A.G.

Dolichopodidae
Diaphorus nigricans , Tata Steel, SE935108, 28/06/2011, A.G.
Chrysotus palustris , Blue Lagoon, SE888145, 21/05/2011, A.G.
Hercostomus nigripennis , Tata Steel, SE907130, 21/07/2011, A.G.
Hydrophorus balticus , Tata Steel, SE907130, 21/06/2011, A.G.
Hydrophorus litoreus , Ashbyville Lake, SE921079, 26/06/2011, A.G.
Sciapus wiedemanni , Messingham Sand Quarry, SE910035, 14/06/2011, A.G.
Sciapus maritimus , Tata Steel, SE935109, 25/05/2011, A.J..
Tachytrechus notatus , Whisby NR, SK9266, 27/05/2011, R.D., A.Go.

Empididae
Empis scutellata , Sawcliffe, SE908133, 02/05/2011, A.G. (see Page 128)
Rhamphomyia variabilis , Sawcliffe, SE906132, 30/08/2011, A.G.
Empis aemula , Whisby NR, SK903676, 30/06/2011, R.D., P.P.
Empis nigritarsis , Whisby NR, SK910667, 13/05/2011, R.D., P.P.

Fanniidae
Fannia hirticeps , Waters Edge Country Park, TA031232, 09/08/2011, J.D.

Lauxaniidae
Sapromyza quadripunctata , Whisby NR, SK913670, 15/05/2011, R.D., A.Go.

Limoniidae
Metalimnobia bifasciata , Tata Steel, SE905130, 21/07/2011, A.G., R.C.
Metalimnobia quadrinotata , Tata Steel, SE934111, 28/04/2011, A.G.
Euphylidorea aperta , Messingham Sand Quarry, SE9103, 22/04/2011, J.Da., A.S.

Micropezidae
Neria ephippium , Blue Lagoon, SE888145, 21/05/2011, A.G.

Muscidae
Hydrotaea meteorica , Whisby NR, SK913670, 15/05/2011, R.D., P.P.
Coenosia pygmaea , Far Ings, TA015231, 11/08/2011, J.D.
Graphomya minor , Far Ings, TA015231, 11/08/2011, J.D.
Limnophora triangula , Far Ings, TA006229, 12/08/2011, J.D.

Psilidae
Loxocera albiseta , Whisby NR, SK905664, 17/07/2011, R.D., P.P.

Ptychopteridae
Ptychoptera minuta , Messingham Sand Quarry, SE9103, 22/04/2011, E.G., A.S.

Scatopsidae
Reichertella pulicaria , Far Ings, TA015231, 09/09/2011, J.D.

Sciomyzidae
Dichetophora finlandica , Conesby Quarry, SE891143, 02/08/2011, A.G.
Renocera stroblii , Tata Steel, SE907130, 21/06/2011, A.G.
Tetanocera punctifrons , Blue Lagoon, SE888145, 14/06/2011, A.G.
Psacadina verbekei , Whisby NR, SK914666, 18/04/2011, R.D., P.P.

Stratiomyidae
Chorisops nagatomii , Tata steel, SE905126, 17/08/2011, A.G.
Oxycera pygmaea , Messingham Sand Quarry, SE912039, 14/06/2011, A.G.
Vanoyia tenuicornis , Messingham Sand Quarry, SE912039, 14/06/2011, A.G.

Syrphidae
Dasysyrphus friuliensis , Tata Steel, SE904130, 02/05/2011, A.G.
Melangyna compositarum , Messingham Sand Quarry, SE912039, 14/06/2011, A.G.

Tachinidae
Eumea linearicornis , Whisby NR, SK917674, 06/06/2011, R.D., P.P.
Phasia barbifrons , Tata Steel, SE907130, 24/05/2011, A.G.
Thelaira solivaga , Whisby NR, SK903676, 27/05/2011, R.D., P.P. (see page 127)

Tephritidae
Merzomyia westermanni , Tata Steel, SE906130, 21/07/2011, A.G.
Sphenella marginata , Conesby Quarry, SE891142, 02/08/2011, A.G.
Campiglossa misella , Ashbyville Lake, SE921084, 26/07/2011, A.G. (see page 127)
Tephritis neesii , Tata Steel, SE933097, 28/04/2011, A.G.

Anthomyzidae
Typhamyza bifasciata , Whisby NR, SK918667, 26/07/2011, R.D., P.P.

The rarely recorded flies of 2012 included;
Anthomyidae
Myopina myopina , Thurlby Pits, SK 889 611, 07/04/2012 & 10/09/2012, RD, A.I., 1st county records.

Cecidomyidae
Contarinia nasturtii , Willow Tree Fen TF173224, 05/06/2012, J.F. 1st county record.

Conopidae
Myopa buccata , Bardney, TF 118 699, 08/06/2012 PP, 2nd county record.
Myopa strandi , Whisby NR SK9166, 16/03/2012 RD, D.C., 1st county record. (see page 127)

Dolichopodidae
Hydrophorus praecox , Whisby NR SK9166 26/08/2012 & 10/09/2012, RD, PP, 3rd/4th county record.
Dolichopus wahlbergi , Whisby NR SK9166, 26/08/2012 RD, PP, 1st county record.

Tachytrechus insignis , Thurlby Pits, SK 889 611,10/09/2012, RD, PP, 4th county record. (see page 127)
Tachytrechus insignis , Whisby NR SK9166, 04/10/2012, RD, PP, 5th county record.

Heleomyzidae
Scoleocentra villosa , Whisby NR, SK9166, 25/03/2012 & 22/05/2012, RD, PP, 2nd/3rd county record.

Lauxaniidae
Tricholauxania praeusta , Whisby NR, SK9166, 22/05/2012, RD, PP 1st county record,

Muscidae
Coenosia atra , Whisby NR SK9166, 04/10/2012, RD, PP, 1st county record.
Hydrotaea cyrtoneurina , Whisby NR SK9166, 25/03/2012, RD, PP, 2nd county record,
Morinia nana , Whisby NR SK9166, 30/05/2012, RD, PP, 1st county record,

Piophilidae
Parapiophila vulgaris , Whisby NR SK9166, 12/08/2012, RD, PP, 2nd county record.

Rhagionidae
Symphoromyia immaculata , The Drift, SK 852 312, 05/06/2012, RD, PP, 3rd county record,

Sarcophagidae
Nyctia halterata , Whisby NR SK9166, 05/07/2012, RD, PP, 1st county record.

Scatophagidae
Spaziphora hydromyzina , Whisby NR SK9166, 07/09/2012, RD, PP, 2nd county record.
Trichopalpus fraternus , Whisby NR SK9166, 04/10/2012, RD, PP, 1st county record,

Sciomyzidae
Dichetophora finlandica , Whisby NR, SK9166, 28/07/2012, RD, PP, 2nd county record.

Syrphidae
Meligramma triangulifera , Whisby NR SK9166, 01/07/12, RD, PP, 1st county record,

Tachinidae
Phytomyptera nigrina , Whisby NR SK9166, 22/04/2012, RD, C.R., 1st county record. (see page 127)
Tachina ursina Thurlby Pits, SK 889 611, 28/03/2012, A.P., PP, 5th county record.

Tephritidae
Dioxyna bidentis , Whisby NR, SK9166, 12/10/2012, RD, PP, 2nd county record.

Tipulidae
Prionocera turcica , Messingham Sand Quarry, SE9103, 23/08/2012, J.Da., A.S.

BEETLES IN 2012

Charlie Barnes

It is not until you tally up the new and interesting records for the previous year that you realize how good, or how bad, it actually was. Despite 2012 being called a "washout" with one of the wettest summers on record it was an excellent year for Notable Beetles.

Mick Talbot found the small weevil *Brachysomus echinatus* on a brownfield site in Lincoln on the 2nd March. A Notable B polyphagous species that can be found at ground level on vegetation, Mick's example was only the second to be seen in South Lincolnshire VC53. On the 21st May, the author also found the species on a Scopwick Heath road verge. Two others, one from Crosby in 2006 and another from Skellingthorpe in 2007, both found by Colin Smith, complete the known records for this species in recent times. Historically it was known from Brigg (1895), Bradley Wood (1907) and Roxton Wood (1910), all in the north of the county.

The day of the LNU AGM (10th March), the author visited a remnant of a hawthorn hedge on a quiet lane to the west of Bassingham, with the aim of recording on the plains of the Upper Witham, which have apparently been neglected over the years. Amongst the 'standard' finds was an elongate tachyporine rove beetle that turned out to be *Ischnosoma splendidum* which has not previously been recorded in South Lincolnshire VC53. The species is more widespread in North Lincolnshire VC54, with 14 records, the most recent of which was collected by Oliver Hedley in Marton on the 26th March.

On the 1st April an advertisement was placed in the Wildnews Bulletin to coincide with Buglife's 3rd year of a public hunt for oil beetles, Meloidae. Historically, Lincolnshire could only boast two species, *Meloe proscarabaeus* (see page 133) and *Meloe violaceus*, neither of which was known from recent records (last recorded in 1984 and 1886 respectively). Although a response wasn't expected, a week later an email was received from Catharine Brown who had identified a male of *Meloe proscarabaeus* from a road verge near Ropsley on the 6th April. As soon as the email was received, a reply was sent asking if a photo had been taken. It hadn't, but an excellent description of the beetle in question was provided and the author was left in no doubt as to the identity of the beetle. The site was visited a few days later on the 10th April and

12 female *Meloe proscarabaeus* were found digging burrows. Despite a search being made along 1km of the verge on both sides, the beetles were only present in a short 100m stretch on the south facing road verge. Catharine's initial communication highlighted the importance of the verge in the 'Life on the Verge' project run by the Lincolnshire Wildlife Trust and the area is certainly worthy of further investigation to see if more colonies of the UKBAP species, *Meloe. proscarabaeus*, exist.

Mark Schofield has confirmed the continual presence of the bloody-nose beetle, *Timarcha tenebricosa* in South Lincolnshire VC53. As reported in The Lincolnshire Naturalist 27:4, *Timarcha tenebricosa* was rediscovered by the author near Brauncewell in 2010. Mark found an adult and a larva on cleavers, *Galium aparine*, on the High Dyke near Temple Bruer in May. All the recent records of this species are currently restricted to the area between the A15, A17 and Grantham Road.

Whilst beating a row of young mixed deciduous trees on a road verge in Gautby on the 10th May, the author found a specimen of the oedemerid beetle *Ischnomera cyanea*. This appears to be the first record for North Lincolnshire VC54. A Notable B species, it has only been recorded 6 times in South Lincolnshire, VC53; Lincolnshire appears to be at the northern edge of its range.
Brian Hedley found a specimen of the nut weevil *Curculio villosus* in Skellingthorpe Old Wood on the 20th May. Easily distinguished from other members of the genus *Curculio* (general appearance black, as opposed to brown), this represents only the second record of this Notable B species for South Lincolnshire VC53. Unlike other members of the genus which feed on catkins or in nuts, larvae of *Curculio villosus* are inquilines in the galls created by *Biorhiza pallida* (which are known as oak-apple galls) where they feed on the gall tissue.

Meloe proscarabaeus (p.132)
Picture Charlie Barnes

Otiorhynchus crataegi (p.134)
Picture Charlie Barnes

The LNU field meeting to Oxgangs House on the 27th May produced two interesting beetles. The first, a minute Notable B rove beetle *Scaphisoma boleti*, has only been recorded twice before in North Lincolnshire VC54. The second, the soldier beetle *Cantharis paludosa*, represents the third record for North Lincolnshire VC54. Known only from Freshney Bog (in 1898 and 1910) in Lincolnshire, it was a surprising species to be re-found. Widespread in the north and west of the UK, but completely absent from southern and eastern England, it inhabits acid peatland in blanket bogs and valley mires. Potentially a vagrant from populations in South-west Yorkshire, VC63 it would be worthwhile to revisit the site to see if a population is present.

At the LNU field meeting to Snitterby Carr (17th June) Alan Phillips found a large male of the "thick-legged flower beetle" *Oedemera nobilis,* the 4th record for North Lincolnshire VC54, last seen in 1901. Considered to be expanding its range, it is common and widespread south of Lincolnshire and may become more prominent, especially in South Lincolnshire VC53 where it is currently known from a single record.

On the 1st July at the LNU field meeting to Baston Fen, a single specimen of the anthribid weevil *Bruchela rufipes* was found by the author on its foodplant wild mignonette, *Reseda lutea.* First found in the UK in 1984 in Essex, it is considered by some to be an import. The foodplant has a preference for waste ground which may account for the weevil's apparent scarcity. It may be more common than records suggest although it has only been found at one other site in Lincolnshire and further searches of its foodplant have yet to reveal further records.

Mick Talbot photographed the weevil *Mecinus labilis* on a brownfield site in Lincoln on the 9th August. This is a characteristic weevil with a black and flesh-pink patterning on the elytra. Despite feeding on Ribwort Plantain, *Plantago lanceolata*, it has only been recorded twice before in South Lincolnshire VC53.

The small blue/green leaf beetles, *Lema cyanella* and *Oulema obscura* were found by the author at the LNU field meeting to Elsea Meadows on the 19th August. *Lema cyanella* has not previously been found within South Lincolnshire VC53 before and *Oulema obscura* has only been recorded on 4 other occasions. Both are considered widespread but the difficulty in separating of the subfamily Criocerinae has caused confusion.

A small bark beetle, *Kissophagus hederae*, was found by the author at the LNU field meeting to Mayflower Wood on the 8th August on an old deciduous tree with abundant ivy *Hedera helix*, in which the larva feed. This is the first record of this Notable B species in North Lincolnshire VC54 and only the 6th for the county as a whole.

Whilst out torching for beetles in a rural garden at Nocton on the evening of the 2nd October, the author found a specimen of the weevil *Otiorhynchus crataegi* (see page 133). A recently introduced species first discovered in Berkshire, it is considered synanthropic and favours such foodplants as garden privet, *Ligustrum ovalifolium* and lilac, *Syringa vulgaris.* This represents the first record of this species in Lincolnshire although it may be more common than currently thought as its foodplants favour locations that are generally under-recorded such as gardens and car-parks where they are used as ornamentals.

Finally, Allan and Annette Binding have been looking at Longholt Wood, a small wood near Nocton, throughout 2012. Among a number of interesting beetles was the Notable B clerid *Tilus elongatus*, which has only been recorded 3 times prior in South Lincolnshire VC53. It is an attractive beetle, with the female being all black except for an orange-red thorax which is absent in the male. Also recorded was *Orchestes alni*, an orange and black weevil that mines the leaves of elm, *Ulmus* sp. Although regarded as nationally common, it has only been recorded in South Lincolnshire VC53 once before.

ACULEATE HYMENOPTERA IN 2012

Alan Phillips

Although a good start to the year was made due to the unusually warm weather in March, recording effort was severely affected by the wet summer, resulting in far fewer field trips than in 2011. Only three species were added to the Lincolnshire list compared to ten the previous year.

Nevertheless on warm days when recording was possible plenty of species were active and there were many interesting finds throughout the season.
In the following text, grid references are centralised for larger sites, and when a site is mentioned more than once, the grid reference is only given in the first instance. Initials in the text belong to the author (ALP), whereas full names are included for other recorders.

Wasps
Cleptes semiauratus (Linnaeus, 1761) – 5th county record, Whisby NR, SK9166, ALP.

Crossocerus leucostomus (Linnaeus, 1758) – 2nd county record, Osgodby Wood, TF0992, ALP. First recorded the previous year at the same location.

Ectemnius lituratus (Panzer, 1804) – 3rd county record, Hykeham Quarry, SK927660, Andy Jukes. First two records from Woodhall Spa, 1947.

Ectemnius sexcinctus (Fabricius, 1775) – 7 & 8th county records, Grimsby, TA259102, ALP.

Nysson dimidiatus Jurine, 1807 – 8th county record, Whisby NR, ALP. A scarce cuckoo wasp of the digger wasps *Harpactus tumidus* and possibly *Lindenius albilabris.*

Passaloecus gracilis (Curtis, 1834) – 7 & 8th county records, Holton Grange, TA298009, ALP; and Nocton Rise, TF043644, Charlie Barnes.

Stigmus pendulus Panzer, 1804 – 3rd county record, Whisby NR, ALP.

Ants
Myrmica specioides Bondroit, 1918 – new county record, Gibraltar Point, TF5557, Andrew Jarman. A species predicted to be at this location as it is found across the Wash on the North Norfolk coast (Phil Attewell, pers. comm.).

Lasius psammophilus Seifert, 1992 – 2nd county record, Gibraltar Point, Andrew Jarman. First recorded in 1958 by Cedric Collingwood, also from Gibraltar Point.

Lasius umbratus (Nylander, 1846) – 7th county record, Whisby NR, Richard Davidson. An alate (winged) queen was collected from a large number swarming on a dead tree in a hedge.

Bees

Andrena bucephala Stephens, 1846 – new county record, Gosberton Clough, TF1929, Leslie Hebdon. This scarce bee was from a batch of specimens found dead on Leslie's porch window ledge, collected through the summer.

Andrena flavipes Panzer, 1799 – 4 & 5th county records, Gosberton Clough, Leslie Hebdon. Found on ground elder *Aegopodium* and dandelion *Taraxacum*.

Andrena nitida (Muller, 1776) – 4 & 5th county records, Gosberton Clough, Leslie Hebdon. Recorded in the garden in the spring of 2011 and 2012.

Andrena tibialis (Kirby, 1802) – 7th county record, Whisby NR, ALP. A spring species which was found on *Salix* flowers.

Andrena varians (Kirby, 1802) – 2nd county record, Oxgangs, Nettleton Top, TF111976, ALP. Recorded at an LNU meeting in May on calcareous grassland. Last recorded in the county in 1941. Although the species seems to be spreading nationally, it is still a very rare bee for Lincolnshire.

Chelostoma campanularum (Kirby, 1802) – 3rd county record, Pinchbeck, TF2325, Kay Heath. This is only the second location in the county the species is known to be present. The other being at Gosberton Clough. Good photos of these tiny bees on *Campanula* in the garden, with the identification kindly confirmed by Mike Edwards.

Lasioglossum malachurum (Kirby, 1802) – new county record, Navenby, SK9858, Charlie Barnes. An early record in the unusually warm period in March. The species was also recorded later in the year at Holton Grange, Mayflower Wood, TA158157, (both LNU meetings) and Whisby NR by ALP. A generally southern species that seems to be extending its range northwards.

Lasioglossum quadrinotatum (Kirby, 1802) – 6 to 8th county records, Navenby, Charlie Barnes; and Whisby NR, ALP.

Sphecodes longulus von Hagens, 1882 – 3 & 4th county records, Gibraltar Point, Andrew Jarman; and Whisby NR, ALP. First recorded from Whisby NR the previous year.

Melecta albifrons (Forster, 1771) – 9 to 13th county records, Boston, TF328438, J. Forington; Horncastle, TF254696, Clare Sterling; Gosberton Clough, Leslie Hebdon; and Syston, SK9240, R. O'Conner. This is the cuckoo bee of *Anthophora plumipes*, the 'hairy-footed flower-bee'.

My thanks to all those who sent in records, specimens and photographs.

SPIDERS IN 2012 & REVIEW

Annette Binding

Since my last spider report in 2009 one new species has been added to the Lincolnshire list, while others have been found after a gap of several years or in new locations.

The species new to the county is *Nigma walckenaeri*. A female of this small green Dictynid was found and identified by Ian Dawson at Stamford on the 17th October 2011 and was reported in the SRS News. The spider is found on many plants and bushes especially ivy on which it makes its retreat on the curled leaves. Ian Dawson has been studying the dramatic northwards spread of *N. walckenaeri* and has found the spider at 111 sites in 11 vice counties. He notes that the species is easy to find in Cambridgeshire and other southern counties but more difficult to locate in Leicestershire and Lincolnshire suggesting that it has only just begun to move into those areas. I have looked at ivy wherever possible but my search so far has merely turned up other Dictynid species. However I shall keep looking for it next summer and autumn. The spread of *N. walckenaeri* has also been reported in British Wildlife Magazine.

Two interesting spiders were found during our survey of Longholt Wood in 2012. Both were beaten from bushes by Allan on our visit on the 19th June. A single male linyphid *Lepthyphantes obscurus* was the first Lincolnshire record since 1990, while the crab spider *Philodromus praedatus* (Nb) was the first record for VC53.

Two new sites for *Steatoda grossa* were added to the database. The first one was found by Karen and Sarah Hand in October 2010 at Addlethorpe near Skegness, the sixth county record. In September 2011 Pip Collyer sent me a spider which had been sent to him by Don Holt who found it at Coningsby. I identified the spider as a female *Steatoda grossa*, the seventh county record. In October I found a new site for *Pholcus phalangioides* when I noticed a single specimen in a clothes shop in Sincil Street, Lincoln.

Colin Smith collected a female *Lepthyphantes minutus* at Crowle Moor NNR on the 17th May 2010, another new site record. This species was last found in Lincolnshire at Moor Farm LWT Reserve in April 2005. Despite its name this spider is one of the larger lnyphids.

Also a new site record, I found a single female *Micaria pulicaria* on the 23rd May 2012 in my garden. This was the first record since 2008.

Among the spiders collected by Colin Smith in 2009 and not mentioned in the 2009 report in Transactions were a number of new site records. These new site records include a male *Clubiona subtilis* from Hibaldstow collected on the 6th January. Colin's visit to Kirkby Moor LWT Reserve on the 16th January produced four new site records, a female *Crustulina guttata*, a female *Ostearius melanopygius*, two *female Ero cambridgei* and a male and female *Ceratinella* *brevipes*. This was the 9th county record of *Ceratinella brevipes*. All the spiders except the male *Ceratinella brevipes* were beaten from gorse. The male *Ceratinella brevipes* was collected from a grass tussock. Kirkby Moor is a well-worked site. Prior to Colin's visit the total number of species recorded from the reserve was 102 including two (Na) and five (Nb) species. Colin's four new site records brings the total up to 106 and illustrates how much more there is still to be found in Lincolnshire.

Colin also collected two species which had very few previous Lincolnshire records. Both were found in moss. The first of these was a male *Dicymbium brevisetosum* from Usselby Plantation on the 30th January. This was only the fourth county record for this species. On the 18th February Colin collected a female *Crustulina sticta* (Nb) at Donna Nook. There are only eight previous records of this species which is nationally scarce.

Finally on the 1st of October 2011 a female *Nuctenea umbratica* came to a sugar trap on a pine tree at Messingham Sand Quarry LWT Reserve. The sugar trap was put out by John Davison to attract moths. I don't know if the spider was attracted to the sugar or to the moths caught there. As far as I am aware this is the first time a spider has been found on a sugar trap in Lincolnshire.

My thanks to all the people who have sent me records and specimens during the past four years.

References

DAWSON, I., 2012. *Dramatic spread of Nigma walckenaeri* Spider Recording Scheme News No.72 in Newsletter British Arachnological Society No. 123: 25 – 26

OXFORD, G., 2012. Spider Report. British Wildlife Volume 23 No.6 August: 438 – 439

BINDING, A. E. 2010. Spiders. Transactions Volume 27 Part 3 Lincolnshire Naturalists' Union

HARVESTMEN IN 2012

Annette Binding

There was one species new to the county in 2012, *Opilio canestrinii*. Several of these were found in my own tiny back garden in late summer. The first one was found on the 22nd August and the last one on the 14th September. The males of *Opilio canestrinii* are easily identified by the dark brown legs contrasting with the orange coloured body and trochanters.

Dicranopalpus ramosus, first reported in the county in 2011, turned up at three new locations in 2012. All were found in August. Charlie Barnes found the species at Whisby Nature Park on the 5th August, I found one at Longholt Wood on the 8th August and Karen and Sarah Hand found it at Chambers Farm Wood Centre also on the 8th August. It appears that *Dicranopalpus ramosus* has been in the county for longer than first thought. In 2012 I received four records from previous years, two from 2011 and two from 2009. Alan Lazenby reported *Dicranopalpus ramosus* at Blankney Fen on 15th September 2011 and Charlie Barnes found it at Banovallum House, Horncastle on the 2nd December 2011. Alan Lazenby found the first of the 2009 specimens at Blankney Fen on the 16th August and Karen and Sarah Hand reported finding 'dozens' of them under a bridge at Addlethorpe on the 19th August. These are the earliest records of *Dicranopalpus ramosus* that I am aware of.

Altogether seven species of harvestmen were recorded in 2012.

My thanks to Alan Dale, John Davison, Eddie Gaunt, Karen and Sarah Hand and Alan Lazenby for sending in their records in 2012.

PSEUDOSCORPIONS IN 2012

Annette Binding

Since my last report in Transactions on pseudoscorpions in 2008, I have received two specimens and four records from Lincolnshire Naturalists Union members. I have also added a number of old records found in old publications such as 'The Naturalist' and 'Lincolnshire Naturalists Union Transactions' and other records have come in via the National Recording Scheme.

The first specimen received was from Alan Phillips, found at Laughton Forest on 16th August 2009. I identified it as *Lamprochernes savignyi*. There is only one previous Lincolnshire record of this species from Saltfleetby-Theddlethorpe in August 1987 found by John Bratton and G. Weaver.

The second specimen was sent to me by Charlie Barnes who found it in his house on the 6th April 2011. I identified it as *Cheiridium museorum*, a very tiny species approximately 1.5mm long. It is also known as the book scorpion. It is found indoors and in the nests of birds living close to man such as house sparrows, pigeons and house martins. This is the 6th Lincolnshire record of *Cheiridium museorum.* It has not been recorded in the county since 1977 when one was found in a house in Londonthorpe near Grantham by L. Lucas on the 17th June.That specimen was put into the Merseyside Museum Collection. Three of the five earlier records of *Cheiridium museorum* were added to the database in 2012 as a result of our research.

All the other records received in 2011 and 2012 came from Silvia Fowler who found *Lamprochernes nodosus* in her compost bin in the same place in both years and in good numbers. *Lamprochernes nodosus* is widely distributed in Great Britain, found in compost and dung heaps and recorded from eight locations in Lincolnshire. It was last recorded in Lincolnshire at Grantham in 2007.

Together with the records already mentioned and records discovered as part of our research, we now have 113 records on the Lincolnshire database dating from 1877 to 2012.

Reference

BINDING, A. E. 2009 *Pseudoscorpions* Transactions Vol. 27 Part 2. Lincolnshire Naturalists' Union

BATS IN 2012

Annette Faulkner

The highlight of the year was undoubtedly the Bat Group finally making contact with the custodians of the Gatehouse to Thornton Abbey, north of Grimsby, owned by English Heritage. Various vague rumours about its importance for bats had reached us over the years, and we had even managed to obtain a brief report from 2005, but although I later learned that monitoring had been taking place, no records were forthcoming, and we knew very little.

All this changed when we were made a private visit in May, and subsequently were able to arrange a Bat Group meeting for late August, when we recorded Natterer's *Myotis nattereri* and brown long-eared *Plecotus auritus* bats, and both soprano and common pipistrelles *Pipistrellus pygmaeus* and *P. pipistrellus* respectively, all but the latter roosting within the Gatehouse. The common pipistrelles appear to be utilising external features, but there are substantial numbers of bats there, and it is certainly the most important site in the north of the county, and probably second only to Tattershall church and Castle in the county as a whole. I have subsequently been able to get hold of an important report from extensive survey work done by ecological consultants in 2006 (and forwarded a copy to English Heritage, who had lost theirs!), and it is hoped to do more work there in 2013.

Also in August we made a visit to a privately owned small 12th century manor house in the south west of the county, of huge historic importance, where, to our delight, we found not only evidence of Natterer's, brown long-eared and pipistrelle sp. roosting, but also a lone barbastelle *Barbastella barbastellus*, a species not found as far north as Thornton Abbey.

Work on barbastelle populations generally is ongoing, with the Limewoods and the south west Lincolnshire woodlands being the main areas where they are found, and evidence of breeding at least in Chambers NNR. To date their distribution appears to be south of a line approximately from Market Rasen to Louth, though the first county record at Holton le Moor in 1956 was north of this. Sadly, they were not found at a survey there in 2010.

Nathusius's pipistrelle *Pipistrellus nathusii* is another elusive species which is now thought to be much more widespread than formerly believed. They are a strongly migratory species, with the majority of records appearing in the autumn, but in 2012 evidence of extensive summer activity was found at Tetney, with suspected breeding, and they have been recorded in the south Lincolnshire fens at Tongue End, at Hubbert's Bridge, and on a number of consultancy surveys around the county. Whether they are on the increase, or whether, with improved technology, we are just getting better at finding them is not known.

On the downside, the dreadful weather in April and May had a devastating effect on pipistrelles, though other species seem to have been less badly affected, and we had a large number of underweight animals brought in, nearly all males, which, if cats hadn't got to them first, we fed up and released. Then by early June we started to get in underweight female pipistrelles that either weren't pregnant or had aborted. Many roosts failed; the bats simply didn't turn up, and others arrived late. We also had far more late born juveniles than normal, with the latest estimated to have been born on about 25th July, 4 to 5 weeks late. This was all caused by a lack of food and abnormal temperatures. Once the Jet Stream moved back to where it belonged in July the number of casualties decreased, but overall bat calls were up by 50% on an average year.

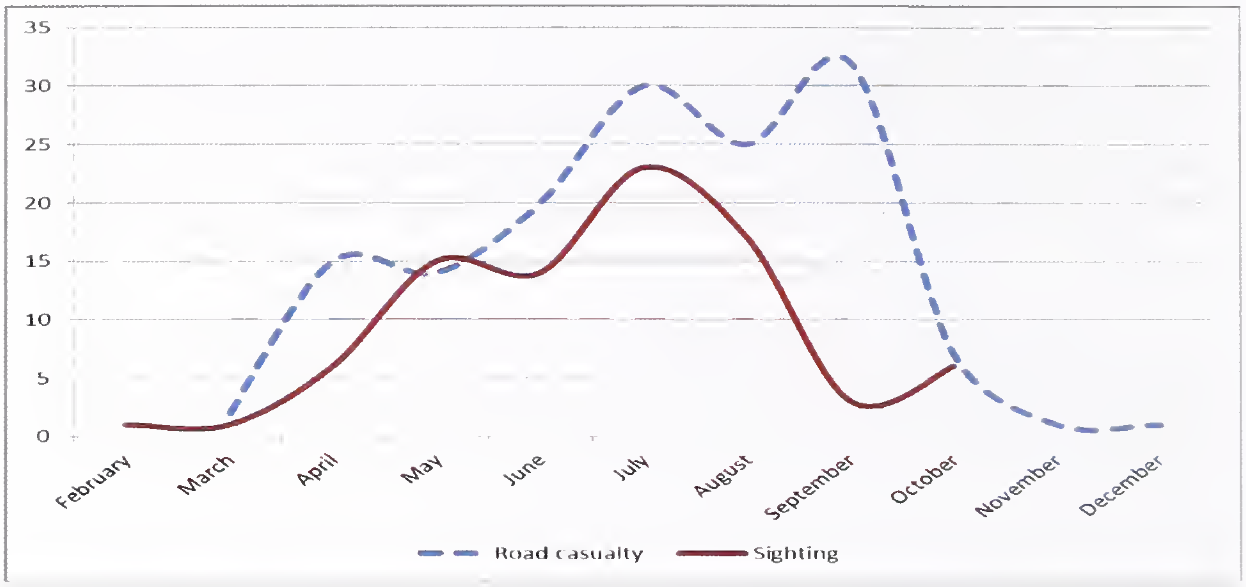
Finally, in July a problem with juvenile bats entering a primary school building in the north turned into a major issue after they were found to be getting into the kitchen, and the building had to be modified to keep them out. The roost was located in an adjacent cavity wall and over 400 mother and juvenile soprano pipistrelles were counted out, the largest recorded colony in the county. They were close to some good habitat and clearly hadn't been affected by the weather!

MAMMALS IN 2012

Chris J. Manning

In 2012, 1,374 records were entered into the mammal database, maintaining the level of individual recording effort established in 2009. Only two recorders submitted more than 100 records, Brian Hedley, (144) and Julie Ellison (117). The most common species were hedgehog *Erinaceus europaeus* (220), brown hare *Lepus europaeus* (174), badger *Meles meles,* (129), grey squirrel *Sciurus carolinensis* (117) and rabbit *Oryctolagus cuniculus* (115).

The increase in hedgehogs is noteworthy as the species is believed to be in decline. This is partly due to 33 records from a new recorder Julie Ellison who lives in the northwest of the country, an area with previously few mammal records, and perhaps greater recording effort as the Hedgehog Survey was regularly featured in the Wildnews Bulletins. Road kill continues as the most prolific source of hedgehog records peaking in late summer as the days shorten and hedgehog numbers are at their maximum with numerous juveniles about.



Monthly hedgehog records by provenance

Most mammal records were of sightings (722), road casualties (360) and pleasingly photographic records (95) are increasing. This is partly due to the photograph records published on the Lincolnshire Bird Club's web site but also a greater use of trail cameras. Unquestionably the biggest record was a sperm whale *Physeter macrocephalus* washed up on the beach at Skegness in early March, the story was widely covered in the media with a length of 35ft (10.7m) and weight of 30 tons widely reported.

LNU FIELD MEETINGS IN 2012

Brian Hedley

29 April, Little Haw Wood, Castle Bytham
SK967 178

A very wet LNU meeting with access courtesy of the Forestry Commission. Led by Brian Hedley and attended by three people in total!

A good range of woodland/marsh plants were noted including wood sorrel, barren strawberry, twayblade, early purple orchid, common spotted orchid, woodruff, hairy woodrush, common valerian, ragged robin, bog stitchwort, wood anemone, yellow archangel and bush vetch.

Twenty three bird species were noted including two marsh tits, buzzard, bullfinch and green woodpecker. Ten mammal species were noted including muntjac, bank vole and pygmy shrew.

27 May, Oxgangs Springs area, Nettleton Top
TF112 976 (see page 145)

A well attended meeting (16 people) led by Richard Chadd and Brian Hedley in hot and sunny conditions. Access courtesy of Rachel Gibbons. A re-visit would be well worth undertaking here.

An excellent range of natural habitats were present and the plant species list compiled was very good. Particular highlights included bugle, brown sedge, carline thistle, field mouse-ear, fen bedstraw, giant horsetail, blunt-flowered rush, ragged robin and crested hair-grass. An adjacent area of arable produced records of prickly poppy, common cudweed, musk thistle and corn spurrey.

A total of 34 bird species were noted including yellow wagtail, tree sparrow and six warbler species. Fox and badger signs were noted and a common lizard was seen.

Butterflies were frequent and nine species were noted including painted lady, wall brown, holly blue and small copper. A single large red damselfly was seen. Moths included Mother Shipton, silver y, common carpet and a drinker caterpillar. A very good selection of bees and wasps were noted by Alan Phillips including five *Nomada* species and seven *Andrena* species with the highlight being *Andrena varians*, a calcareous grassland species and only the second county record.

17 June, Bridge Farm, Snitterby Carr
TF018 946 (see page 145)

LNU meeting to Bridge Farm (courtesy of Patty Phillips) led by Brian Hedley and attended by 11 people. Mainly overcast with occasional brief sunny spells.

About 180 plant species noted including southern marsh orchid, greater spear-wort and common valerian. 31 bird species were noted including turtle dove, yellow wagtail and tree sparrow. Smooth newt, common toad and common frog were also noted.

Invertebrates included four damselfly species: azure, common blue, blue-tailed and banded agrion; Two butterfly species: common blue and large skipper. A range of moths included cinnabar, garden carpet, large yellow underwing, middle-barred minor, common carpet, drinker (caterpillar), yellow shell, silver ground carpet, silver Y, *Eucosma cana, Nemophora degeerella, Pammene aurana* and timothy tortrix.

A good list of bees, wasps and ants was compiled by Alan Phillips including 7 *Bombus* species and 5 *Andrena* species. Beetles included the spectacular long-horn *Agapanthia villosoviridescens*. Hoverflies included *Volucella bombylans* (both white and red-tailed forms) and *Volucella pellucens.*

1 July, Baston Fen farmland area
TF 143 159 (see page 145)

Visit to private area of farmland courtesy of Nicholas Watts to particularly look for arable 'weeds' of interest. Led by Brian Hedley and attended by 11 people on a mostly overcast afternoon with very brief periods of sunshine.

Field margins produced records of night-flowering catchfly (locally frequent), dwarf spurge, Venus's looking-glass, sharp-leaved fluellen, common fumitory, maple-leaved and fig-leaved goosefoots, cut-leaved deadnettle, flixweed, treacle mustard, small toadflax and grey field speedwell.

A good range of odonata were noted comprising brown hawker, black-tailed skimmer, broad bodied chaser, red-eyed damselfly, common blue damselfly, azure damselfly and blue-tailed damselfly. Butterflies were sparse and comprised large white, small white and large skipper. Moths included yellow shell, silver Y and silver-ground carpet.

A water beetle, *Hydroglyphus geminus*, was a good find by Richard Chadd amongst a selection of aquatic invertebrates including water scorpion.

Mammals included stoat, brown hare and some barn owl pellets containing skulls of both bank vole and field vole. Annette and Colin Faulkner came back in the evening and had records of common pipistrelle and noctule bats over the farm.

Thirty-one species of bird were noted including corn bunting, turtle dove, lapwing, yellow wagtail, oystercatcher and grey partridge (family party).

15 July, Elysium Nature Reserve, Holton le Clay
TA298 009 (see page 145)

A joint LNU and British Dragonfly Society field meeting to this private site led by Brian Hedley and Chris Manning. Attended by a total of 15 people on a partly sunny day.

Seven species of odonata comprised azure, common blue and blue-tailed damselflies, banded demoiselle, emperor, black-tailed skimmer and common darter. Nine species of butterflies included large skipper, red admiral, comma and good numbers of meadow brown and ringlets.

Thirty six bird species were noted including little egret, buzzard, oystercatcher, yellow wagtail, reed warbler, linnet and reed bunting. Mammals included signs of water vole. A common toad was also noted.

Moths included yellow shell, elephant hawk and common grass veneer.

Apart from bumblebees, there were not many bees/wasps about, with the best find (by Alan Phillips) being the solitary bee *Lasioglossum malachurum*. Several females were swept from scentless mayweed. This is the second county record and first for VC54 and thought to be the most northerly for the species in the

Field Meetings 2012

Oxgangs Springs (p.143)
Picture Brian Hedley

River Ancholme at Snitterby Carrs (p.143)
Picture Brian Hedley

Species-rich field margin Baston Fen (p.144)
Picture Brian Hedley

Elysium Nature Reserve (p.144)
Picture Brian Hedley

Large ditch at Elsea Park Meadows (p.146)
Picture Brian Hedley

Fungus Foray Rigsby Wood (p.147)
Picture Brian Hedley

UK. *Passaloecus gracilis, Mimumesa dahlbomi and Bombus barbutellus* were also good finds.

19 August, Elsea Park Meadows and Math/Elsea Wood SSSI, Bourne TF09 18 (see page 145)

A meeting led by Brian Hedley on a warm and sunny day with access courtesy of Elsea Park Community Trust and Richard Adcock.

Plant highlights included large amounts of orange foxtail (*Alopecurus aequalis*) mainly floating on the surface of a ditch plus good stands of thin-spiked wood sedge (*Carex strigosa*) along a woodland ride.

Young frogs and toads were frequent. An adult and a young smooth newt were also found.

A range of beetles were noted by Charlie Barnes including *Lema cyanella* (1st record for VC53) and *Oulema obscura* (4th record for VC53) both found in the car parking area!

A good range of odonata were noted (12 species) including small red-eyed damselfly, emerald damselfly, banded demoiselle, southern hawker, brown hawker, emperor, at least 150 swarming migrant hawkers and very good numbers of both common darter and ruddy darter.

Eleven species of butterfly were noted including both common and holly blues. Moths included lesser-spotted pinion, silver Y, cinnabar and *Udea lutealis*. Other invertebrates included hornet, dark bush-cricket and Roesel's bush-cricket.

Twenty-six bird species were recorded including a close encounter with a roosting tawny owl plus marsh tit, nuthatch, buzzard and several green woodpeckers.

8 September, Mayflower Woods, Immingham
TA158 157

A meeting comprising an afternoon session plus a moth/bat evening attended by 11 people and led by Brian Hedley. Access courtesy of ConocoPhillips. A hot and sunny afternoon but the temperature dropped away rapidly in evening. Bats comprised at least five common pipistrelles and two noctules, the former species enjoying the moth trap buffet! Other mammals included common shrew, fox and roe deer.

Thirty-two bird species noted including hobby (one dashing low through the car park trying to catch the local house martin flock off-guard), at least two pairs of very vocal tawny owls, a skein of night-flying pink-footed geese heard overhead, a willow tit and two treecreepers.

A young smooth newt was noted in the new pond near the car park plus several young common frogs around the site.

Ten butterfly species recorded including brown argus, common blue and red admiral.

Dragonfly/damselflies comprised emerald damselfly, southern hawker, migrant hawker, emperor, ruddy darter and common darter. About 26 moth species noted during course of afternoon and evening including silver Y, angle shades, snout, common marbled carpet, dingy footman, copper underwing, centre-barred sallow and single-dotted wave.

A good list of beetles was compiled by Charlie Barnes and included a new vice-county (VC54) record in *Kissophagus hederae* (Nationally Notable b), an ivy-boring beetle. Recorded at one other site in the whole of Lincolnshire, although it really should turn up more often given it's foodplant! Other invertebrates included common groundhopper, forest bug, hawthorn shield bug, sloe shield bug, green shield bug and *Dicranopalpus ramosus* (a harvestman). Also several very large tiger slugs.

A wide variety of plants were recorded including good amounts of agrimony and also three duckweed species (least, common and fat). Elm trees were a feature of the woodland belt near the car park.

21 October, Rigsby Wood LWT reserve, Nr Alford
TF424 764 (see page 145)

LNU annual fungi foray led by Ray Halstead and attended by 16 people in overcast and cool conditions.

A very good range of fungi noted, approximately seventy species, especially on the decaying log piles. Noteworthy species were *Auriscalpium vulgare* (Earpick Fungus), *Macrotyphula juncea* (Slender Club) and *Mycena haematopus* (Burgundydrop Bonnet).

Over 90 plant species recorded including water avens, yellow pimpernel, hairy brome, woodruff and greater stitchwort.

Seventeen bird species recorded including tawny owl, jay, buzzard and a fly-over skein of 30 pink-footed geese.

Other records included brown hare, dark bush-cricket, crampball fungus weevil (larvae develop inside the black fungus *Daldinia concentrica*), hawthorn shield-bug and *Dasineura ulmaria* (a dipteran gall on meadowsweet).

INDOOR MEETINGS IN 2012

14th January	Professor. Mark Seaward 'Joseph Banks, James Edward Smith and the Linnean Society'
11th February	Recorders' Meeting
10th March	Annual General Meeting
24th November	Clair Dinham 'Buglife's Stepping Stones Project'

SECRETARY'S REPORT FOR 2012

Charlie Barnes

For another year, membership of the LNU increased. It is reassuring in these times of austerity that we are able to remain in a state of positive gain. The addition of new members is no doubt in part due to the efforts at field meetings, events such as the Lincolnshire Show and the quality of publications. Thanks are due to all those involved.

A number of developments over the past year have been keeping the Executive Committee and others busy, most notably debating on the future location of the archives, library and herbaria following the change of ownership of the store room at Riseholme. The Executive Committee also met four times over the year and the summer field meetings covered a diversity of sites. As always the field meetings and winter indoor meetings were well received, with good attendance over the year.

EDITORIAL

Phil Porter

I hope you have enjoyed the second Lincolnshire Naturalist that I have produced. A year's experience has eased the passage of the 2012 Transactions considerably as last years production was very much a case of 'learning on the job'. I have discovered a number of helpful attributes in the publishing programme that would have saved me endless time last year if I had been aware of them, and undoubtedly there are many others still to be revealed

Lincoln Print and Copy Centre were asked to print this issue as they were able to handle material produced with the basic Windows Publisher programme whereas our previous printer made it clear that they much preferred me to work with a considerably more expensive programme which in addition was probably going to become a subscription item in the future.

However LP&CC did require that the number of facing pages including colour had to be limited if our budget was to be met. As a result the illustrations are 'clustered' although only a very few do not appear within the pages involved in their subject, and they are all cross-referenced.

I have also compressed the material somewhat compared to last year's issue which I thought was a little distended and resulted in the necessity for two books. Please make your feelings known to the executive if this format affects your enjoyment.

Thanks are of course due to all the contributors, a few of whom needed a little encouragement to put pen to paper. I hope that the shorter contributions might inspire many others to offer up a few paragraphs as I think they add greatly to the balance of the contents.

TRANSACTIONS OF THE LINCOLNSHIRE NATURALISTS' UNION

Officers of the Union in 2012
(Year of election to the Executive Committee)

President Roger Parsons (2010)
President-elect Ian Macalpine-Leny (2001)
Honorary Secretary Charlie Barnes (2010)
Honorary Treasurer Ian MacAlpine-Leny (2001)
Membership Secretary via LWT
Publicity Secretary Roger Parsons (2010)
Programme Secretary Vacant (winter) and Brian Hedley (2007) (summer)
Editor of Transactions Phil Porter (2008)
Auditor Emma Murray (Nicholsons)
Executive Committee Colin Smith (2001), Chris Manning (2001), Richard Chadd (2002), Nick Tribe (2004), John Flynn (2012), Alan Phillips (2012)
External representatives
Lincolnshire Biodiversity Partnership - Ian Macalpine-Leny,
Lincolnshire Bird Club Committee - Ian Macalpine-Leny,
Lincolnshire Wildlife Trust Biodiversity Team - Richard Chadd,
Local Wildlife Sites Panel - Richard Chadd

Section Recorders

Ants Bees and Wasps	Mr. Alan Phillips
Bats	Mrs. Annette Faulkner
Beetles	Mr. Charlie Barnes
Bryophytes/Lichens	Professor Mark Seaward
Butterflies	Mr. Allan Binding
Dragonflies	Mr. Nick Tribe/Mr. Richard Chadd
Fish	Mr. Ian MacalpineLeny/Mr. Nick Bromidge
Flies	Mr. Andrew Godfrey (coordinators Mr. John Flynn/Mr. Phil Porter
Freshwater Invertebrates	Mr. Richard Chadd
Freshwater Algae	Mr Bill Brierley
Fungi	Mr. Ray Halstead
Geology	coordinator Ms. Helen Gamble
Grasshoppers and Crickets	Mr Brian Redman
Higher Plants	Mr. Paul Kirby
Mammals	Mr. Chris Manning
Marine Invertebrates	Mr. Helgi Gudmundsson
Molluscs (non marine)	Mr. Alex Pickwell
Moths	Mr. Colin Smith
Plant Galls	Mr. Graeme Clayton
Sawflies	Dr. David Sheppard
Shieldbugs	Mrs. Annette Binding
Pseudoscorpions	Mrs. Annette Binding
Spiders	Mrs. Annette Binding
True Bugs	Mr. Colin Smith

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for 2011

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Cover picture Hoverfly Episyrphus balteatus (Photo: Madeleine Wapplington)